TREATMENT OF SEVERE ACUTE MALNUTRITION: THE POSITIVE EFFECT OF CAREGIVERS' KNOWLEDGE OF TREATMENT OBJECTIVES ON TREATMENT OUTCOMES AT DADAAB REFUGEE CAMPS, KENYA

By

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DECLARATION

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ABSTRACT

Objective: To determine the relationship between caregivers' knowledge of treatment objectives and the default rates of children with severe acute malnutrition (SAM) in community-based programmes.

Methods: A cohort study design was used. The study was conducted in Ifo and Hagadera refugee camps in Kenya which began on 21st May, 2015 and ended on 31st July 2015. Each refugee camp contributed half of the total sample. A total of 128 children, 6–59 months old who had severe acute malnutrition and met inclusion criteria, together with their caregivers, were selected from the stabilisation centre (SC) ($n = 44$) and out-patient therapeutic feeding programme (OTP) ($n = 84$). A standardised structured questionnaire was used to collect data on caregivers' knowledge of treatment objectives, caregivers' perceptions of quality of care, and on defaulting. The child's weight, height, mid-upper-arm circumference (MUAC) and length of stay were taken. Study participants were followed for a period of two months and there was no loss to follow-up. SC children who were in phase II of treatment were enrolled and followed up until they were discharged or defaulted. OTP children who were in their second weekly visit were also enrolled in the study and followed up until they were discharged or defaulted. Data was captured on Microsoft Excel and cleaned and analysed using SPSS version 17.0. A p-value of <0.05 was considered significant.

Results: A total of 128 children were enrolled in the study. Their median age was 12 months and most of them were within 6–23 months of age. The average age of the caregivers in SC was 27.8 years (±5 years), while in OTP it was 27.4 years (±7.1 years). There were no defaulters. The median length of stay for SAM cases in SC was 10 days, while in OTP it was 35 days. No significant difference was found in the length of stay between SAM cases admitted with a lower MUAC of 11.4 cm and those admitted with a MUAC ≥ 11.5cm. The average weight gain rate in SC and OTP was 3.85 g/kg/day and 4.21 g/kg/day respectively. The mean score of caregivers' knowledge of treatment objectives in SC was 52.8%, while for OTP was 58%. Most of the caregivers

from Ifo refugee camp had more positive ratings and perceptions about the programme's services than those from Hagadera refugee camp.

Conclusion: The findings of this study suggest that caregivers' knowledge of treatment objectives may greatly influence the treatment outcomes of SAM cases due to treatment compliance. In addition, caregivers' perceptions of healthcare services provided in community-based management of acute malnutrition (CMAM) programmes may be affected greatly by their interaction with healthcare workers. Consequently, their perceptions could influence their satisfaction with CMAM services and compliance to treatment. Therefore, the delivery of CMAM services that effectively incorporate patient-centred care principles may provide a promising approach for scaling up the performance of the CMAM programmes.

OPSOMMING

Doelwit: om die verhouding tussen ouers se kennis behandelings doelwitte en die uitval syfers van kinders met 'n ernstige akute wanvoeding (EAW) in gemeenskapsgebaseerde programme te bepaal.

Metodiek: 'n Kohort studie-ontwerp is gebruik. Die studie is onderneem in Ifo en Hagadera vlugtelingkampe in Kenia tussen Junie en Julie 2015. Elke vlugtelingkamp het bygedra tot die helfte van die totale study groep. ’n Totaal van 128 kinders, 6-59 maande oud met ernstige akute wanvoeding en wat aan die insluitings kriteria voldoen het, tesame met hul versorgers, is gekies uit die stabilisering sentrum (SS) (*n* = 44) en buitepasiënte terapeutiese voedingsprogram (BTV) (*n* = 84). 'n Gestandaardiseerde gestruktureerde vraelys is gebruik om data in te samel van versorgers se kennis aangaande behandelings doelwitte, die versorgers se persepsies van die gehalte van sorg en oor afwesig wees. Elke kind se gewig, lengte en mid-arm omtrek is geneem. Studie deelnemers is opgevolg vir 'n tydperk van twee maande en daar was geen verlies aan opvolg nie. Stabilisering sentrum kinders wat in fase II van behandeling kon deel vorm van die studie en is opgevolg totdat hulle ontslaan is of uitgeval het. Buitepasiënte terapeutiese voedingsprogram kinders wat in hul tweede weeklikse besoek kon ook deel vorm van die studie en is opgevolg totdat hulle ontslaan of uitgeval het. Data is ingelees op Microsoft Excel, en skoongemaak en ontleed met behulp van SPSS weergawe 17.0. ‘n P-waarde van <0.05 is as betekenisvol beskou.

Resultate: ’n Totaal van 128 kinders het deel gevorm aan die studie. Die gemiddelde ouderdom van die kinders was 12 maande en die meerderheid was tussen 6-23 maande oud. Die gemiddelde ouderdom van die versorgers in SS was 27.8 jaar (± 5 jaar) en 27.4 jaar (± 7.1 jaar) in die BTV groep. Geen van die kinders het tydens die studie tydperk uitgeval nie. Die mediaan tydperk van opname vir EAW gevalle in SS was 10 dae, terwyl dit in BTV 35 dae was. Geen beduidende verskil is gevind in die duurte van opname tussen EAW gevalle met 'n mid-arm omtrek van <11,4 cm en diegene toegelaat met 'n mid-arm omtrek ≥ 11.5cm. Die gemiddelde gewigstoename in SS en BTV was 3,85 g/kg/dag en 4.21 g/kg/dag onderskeidelik. Die gemiddelde punt

van versorgers se kennis ten opsigte van behandelings doelwitte in SS was 52,8%, terwyl dit vir OTP 58% was. Die meerderheid van die versorgers van Ifo vlugtelingkamp het ‘n positiewe terugvoer en persepsie aangaande die dienste van die program inv vergelyking met dié van Hagadera vlugtelingkamp.

Gevolgtrekking: Die bevindinge van hierdie studie dui daarop dat versorgers se kennis van behandelings doelwitte grootliks die behandeling uitkomste EAW gevalle kan beïnvloed as gevolg van behandelings toegeeflikheid. Verder mag versorgers se persepsies van gesondheidsdienste wat in gemeenskapsgebaseerde behandeling van akute wanvoeding behandelings programme grootliks beïnvloed word deur hulle interaksie met gesondheidswerkers. Gevolglik kon hulle persepsies die tevredenheid met akute wanvoeding programme beïnvloed en hulle nakoming van die behandeling.

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Contributions by principal researcher and fellow researchers

The principal researcher (Alexander Mbogo) developed the idea and the protocol. The principal researcher planned the study, undertook the data collection (with research assistants), captured the data for analysis, analysed the data with the assistance of a statistician (Ms Tonya Esterhuizen), interpreted the data and drafted the thesis. (Dr E Van Niekerk, Ms C Schübl and Dr Irene Ogada) provided input at all stages and revised the protocol and thesis.

ACRONYMS AND ABBREVIATIONS

CMAM	Community-based management of acute malnutrition
CTC	Community-based therapeutic care
F-100	Formula with 100 calories per 100 millilitre of liquid
F-75	Formula with 75 calories per 100 millilitre of liquid
GAM	Global acute malnutrition
IMAM	Integrated management of acute malnutrition
LOS	Length of stay
MUAC	Mid-upper arm circumference
OTP	Out-patient therapeutic feeding programme
PCC	Patient-centred care
RUTF	Ready-to-use therapeutic feeds
SAM	Severe acute malnutrition
SC	Stabilisation centre
SD	Standard deviation
SPSS	Statistical Package for Social Sciences
TFCs	Therapeutic feeding centres
TSFP	Targeted supplementary feeding programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children's Emergency Fund
WHZ	Weight-for-height *z*-score

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CHAPTER 1: LITERATURE REVIEW

1.1 INTRODUCTION

In an effort to reduce child mortality, various stakeholders such as governments, donors and humanitarian agencies have made a concerted effort to reduce the prevalence of severe acute malnutrition (SAM).[1] Significant nutrition interventions aimed at addressing SAM cost-effectively and efficiently have been formulated. There has been a significant reduction in SAM globally due to the recent development of community-based management of acute malnutrition (CMAM).[2,3] However, numerous challenges remain in addressing SAM, particularly in sub-Saharan Africa, where out-patient therapeutic feeding programmes (OTPs) are characterised by low recovery rates and increased default rates.[2,3] This undermines the efforts to fight SAM, which is one of the leading causes of death among children under the age of five years. There is a need to examine possible factors that may be contributing to setbacks currently experienced in CMAM programmes to reduce these prevailing mortality rates amongst children under five years of age in sub-Saharan Africa.

1.2 CURRENT STATE OF SEVERE ACUTE MALNUTRITION

SAM refers to a clinical condition in which a child presents with either bilateral nutritional oedema, a mid-upper arm circumference (MUAC) <11.5 cm and/or weight-for-height *z*-scores (WHZ) <–3 standard deviations (SD) of the median World Health Organization (WHO) child growth standards of 2006.[3] Globally, about 10% of children under the age of five years (55 million) are undernourished; of these 19 million suffer from SAM.[1] Most of these cases are from sub-Saharan Africa and South Asia. According to the WHO, children affected by SAM have a five- to twenty-fold risk of death compared to children who are well nourished.[2] In Kenya, the prevalence of acute malnutrition is about 4%, with the north eastern region being the worst affected with prevalence of 13.3%.[4]

SAM is considered to be either a direct or indirect cause of death amongst children under the age of five years, and contributes to about one million deaths every year in children in this age group.[2,3] The prevalence of malnutrition is relatively higher in

populations experiencing emergency situations such as natural disasters like floods and earthquakes of high magnitude, or from regions of conflict, such as civil war zones, when compared to populations that come from regions of relative peace. Malnutrition contributes to about half of the deaths in children under the age of five years in populations living in refugee camps. (2013)[5] The evolution of the management of severe acute malnutrition from traditional feeding centres to community-based management of acute malnutrition (CMAM) has been recognised as one of reasons for the reduction of high mortality rates.[6]

1.2.1 Traditional feeding centres

Traditional feeding centres (TFCs) refer to a hospital-based approach that involves the treatment of SAM, with or without medical complications, in an in-patient care setting. Initially, such SAM cases were retained in these centres until full recovery was achieved.[6] TFC was constituted of large in-patient centres, where children admitted with SAM stayed for at least 21 days. The WHO treatment protocol for management of SAM was used. Caregivers accompanying children with SAM in these centres had to stay with their children for about three weeks. Limited resources and infrastructure in TFCs restrict their capacity to deal with large patient numbers.[6]

Long periods of stay by caregivers in TFCs contributed to family disruptions as they had to leave other children at home or suspend income-earning activities. This contributed to the unwillingness of caregivers to stay for prolonged periods, thereby reducing the effectiveness of these centres.[7] Prolonged hospitalisation is associated with high default rates and an increase in mortality due to cross-infections from overcrowding. This is also evident in children diagnosed with SAM, where mortality rates are as high as 30%.[8]

Research shows that timely detection of SAM cases before medical complications occur makes treatment easier and improves the prognosis.[6] However, research shows that in TFCs, SAM cases were detected at a late stage, after medical complications had developed, resulting in a poorer prognosis for affected children. In addition, setting up

TFCs is expensive, as they require complex infrastructure and a massive financial outlay for experienced healthcare workers to provide adequate care.[8]

1.2.2 Community-based management of acute malnutrition

In order to address the shortcomings associated with TFCs, a pilot study of a simple but effective treatment model was implemented through the combined efforts of humanitarian agencies and the governments of Ethiopia and Malawi.[8] This model focused on treating SAM cases at a community level. SAM cases were treated at home through ready-to-use therapeutic foods (RUTFs). Community mobilisation and outreach programmes were key components for behaviour change and participation in the programme.[2] This led to an evolution from therapeutic feeding centres to community-based management of acute malnutrition (CMAM). Owing to the remarkable success of CMAM recorded during the pilot in 2001, humanitarian agencies started implementing this model in emergency settings.

In 2007, a joint statement on community-based management of acute malnutrition was issued by the United Nations. By 2010, the CMAM model was being implemented by more than fifty-five countries globally.[8, 9, 11] Community-based therapeutic care (CTC) is a term that was initially used for CMAM, and the two are often used interchangeably. In some countries, this approach has been integrated in health systems, and is referred to as the integrated management of acute malnutrition (IMAM). In Kenya, IMAM is practiced in both rural areas and refugee camp settings.

Numerous factors contributed to the success of CMAM, including community mobilisation and participation. Anthropological studies indicate that because communities did not have knowledge of the bio-medical nature of SAM, they frequently consulted with traditional healers, which resulted in delays in the presentation of SAM cases to the TFCs.[8]

During the development of the CMAM approach, communities were actively engaged Once community members had an understanding of the treatment offered by the CMAM

programme, they accepted the case for early presentation of SAM cases.[8,11,11]

Another factor that played a significant role in the CMAM model's success was the application of new classification criteria for acute malnutrition. The evolution of the CMAM approach gave rise to the revision of the WHO classification of acute malnutrition which was [9,11,12,13] either moderate acute malnutrition (MAM) or SAM, based on anthropometry and nutritional bipedal pitting oedema to include MAM or SAM with presence or absence of medical complications.[15,16]

The presence of medical complications determines whether SAM cases are admitted to a stabilisation centre (SC) or an out-patient therapeutic feeding programme (OTP). The development of the CMAM model found that admission in TFCs of severe acute malnutrition without medical complications had negative implications such as exposing children to cross-infections. Furthermore, SAM cases without medical complications who were admitted to TFCs as in-patients, were found to increase the operational costs, and a reduction in the impact of treatment offered was observed. On the other hand, moderate acute malnutrition cases with medical complications who were not admitted to TFC in-patient care units were likely to have high morbidity and mortality rates, which in turn would negatively affect the effectiveness of emergency nutrition programmes.[15]

Another success in CMAM model was use of the mid-upper arm circumference (MUAC) for screening. The use of MUAC has simplified admission procedures and is used for routine growth monitoring. MUAC is a good predictor of mortality which makes it an effective screening tool for SAM.[8]

The development of RUTFs that are safe for nutritional rehabilitation at home was another breakthrough in the CMAM evolution. The use of liquid diets in TFCs was only possible in in-patient setups. A high level of hygiene during preparation of these therapeutic feeds was crucial. Where refrigeration facilities were not available, left-overs were supposed to be discarded after use to avoid contamination. Food contamination because of poor hygiene in preparation of therapeutic feeds and inadequate storage

caused life-threatening diarrhoea.[15] For this reason, it was not possible to use a liquid diet outside of an in-patient setting. This necessitated the development of RUTFs that could be eaten directly by the child without reconstitution.[15]

RUTFs refer to crushable or soft foods that can be consumed directly from the packaging by children older than six month. It has a nutritional composition similar to that of F100, a milk-based formula recommended by the WHO for the recovery phase of SAM. An RUTF is more energy-dense when compared to F100 and is formulated by substituting part of the dried milk in F100 with peanut butter (Table 1.1).[3]

Lastly, the decentralisation of access of CMAM services has made it an effective model. Access to TFCs was found to be one of the barriers to early admission and compliance to treatment. Therefore, CMAM adopted an approach of decentralising service access points by using existing public health infrastructure to screen, admit SAM children and provide nutrition rehabilitation. This resulted in improved coverage rates and greater impact.[8]

Table 1.1: Nutritional composition of F100 and ready-to-use therapeutic feed [3]

	Per 100 g	
	F100	**RUTF**
Macronutrients		
Energy (KJ)	414	2281
Protein (g)	2.5	13.6
Lipids (g)	5	35.7
Minerals		
Potassium (mg)	212	1111
Calcium (mg)	58	320
Magnesium (mg)	15	92
Zinc (mg)	2.1	14
Copper (mg)	0.3	1.8
Iodine (µg)	14	110
Selenium (µg)	4	30
Iron (mg)	0.4	11.5
Vitamins		
Thiamine (mg)	0.1	0.6
Riboflavin (mg)	0.3	1.8
Vitamin B-6 (mg)	0.1	0.6
Vitamin B-12 (µg)	0.3	1.8
Vitamin C (mg)	9.7	53
Folic acid (µg)	39	210
Niacin (mg)	1	5.3
Biotin (µg)	12	65
Pantothenic acid (mg)	0.6	3.1
Retinol (µg)	154	910
Vitamin D (µg)	2.9	16
Vitamin K (µg)	2.9	21
Vitamin E (mg)	3.9	20

1.2.2.1 Components of community-based management of acute malnutrition

A community-based management of acute malnutrition (CMAM) programme has three main components, SC, OTP and targeted supplementary feeding programme (TSFP).

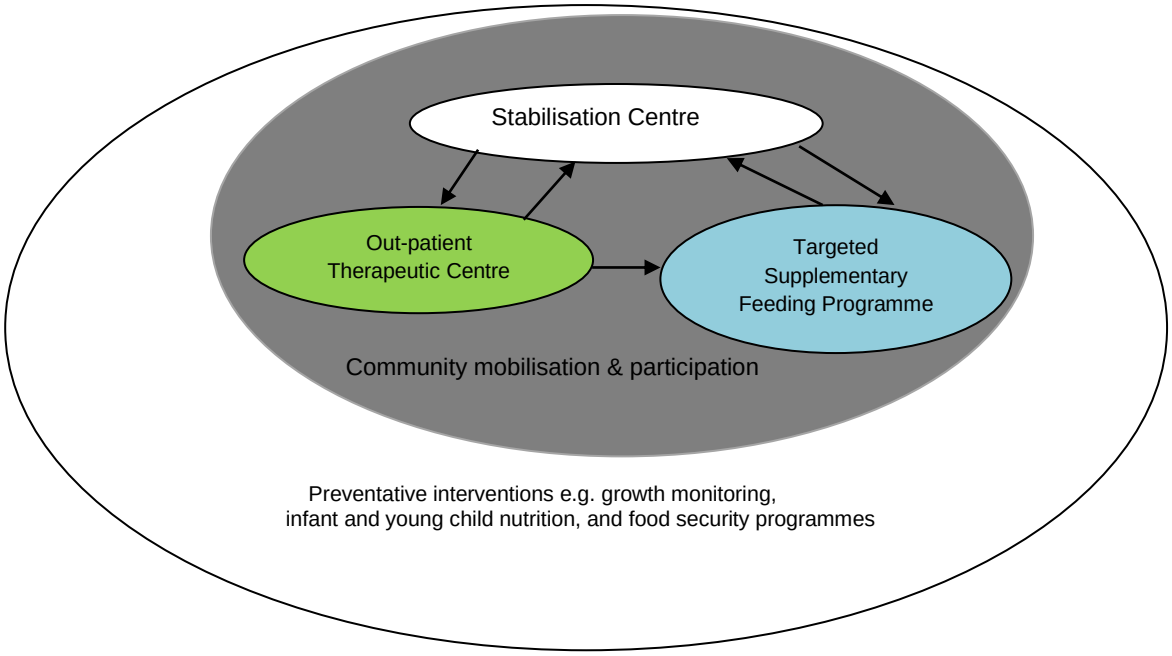


Figure 1:1: Community-based management of acute malnutrition programme [3]

The treatment of SAM children with medical complications and infants under the age of six months weighing <4 kg or with visible wasting is done in SC.[9] Children with SAM without medical complications are treated at OTP. Management of moderate acute malnutrition in children under-five years of age without medical complications is done in TSFPs.[6] A child meeting discharge criteria in SC is referred to OTP while a child who meets discharge criteria in OTP is referred to the TSFP. If the child deteriorates when in TSFP, the child can be referred back to either OTP or SC, according to their admission criteria.

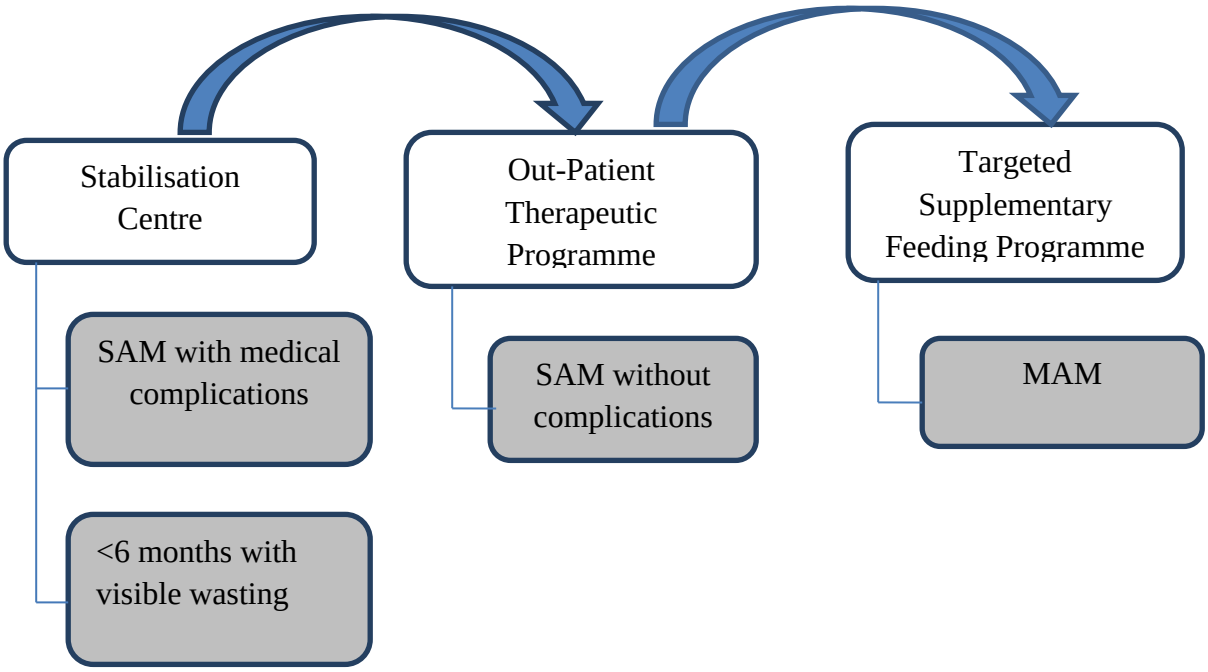


Figure 1:2: **Diagnosis and treatment programmes**

More details on each of the components of CMAMs are provided below.

1.2.3 Stabilisation centres

Admission criteria for SAM cases in SC include WHZ <–3SD, MUAC <11.5 cm and/or bilateral pitting oedema and the presence of medical complications.[10] Refer to Figure 1.2. There are two categories of admissions in SC. The first is newly admitted SAM cases that meet the above admission criteria. The other category is readmitted cases, such as defaulters who have returned to complete treatment, or transfers from other SC sites. Relapse cases are considered and treated as new cases. This is because a child who relapsed had been formerly discharged as cured.[9]

The caregiver of a child who has met the admission criteria to SC should be given an explanation of how the SC operates. He or she should be informed of the child's prognosis, the estimated duration of stay and the discharge criteria.[9] On average, a child admitted to SC takes seven to ten days before being discharged to OTP. In addition, caregivers should be counselled on the child's dietary and medical treatment as well as proper hygiene practices. Treatment in SC, according to current WHO

recommendations, is carried out in three phases, namely 1) Phase I, 2) Transition phase and 3) Phase II.[9]

1.2.3.1 Phase I

This phase involves the immediate initiation of life-saving treatment for medical complications using the WHO's ten-steps. Hypoglycaemia, hypothermia and dehydration are life-threatening conditions in SAM cases. These first three conditions are aggressively managed and patients are stringently observed for the first two days. Electrolyte imbalances are corrected and monitored throughout recovery until the patient is discharged.

In the first seven days, therapeutic feeds used for rehabilitation have a low iron content; supplementation of iron in SAM children during the first few days before stabilisation is discouraged because the presence of iron free radicals creates a favourable medium for bacterial growth.[11] During the first seven days, cautious feeding is initiated and once the child is stable and the appetite has improved, is followed by catch-up growth therapeutic feeding. In addition, sensory stimulation is promoted from the first day until the child is fully recovered in the stabilisation centre. This involves the provision of structured play therapy using toys, with the assistance of caregivers.[9]

Children with severe acute malnutrition are treated for infections from the first day for seven days in the stabilisation centre. Medical treatment involves the provision of routine medication to treat infections. Systematic antibiotics are provided to all SAM cases on admission. Where infections in acutely malnourished children do not manifest with classical symptoms, owing to a suppressed immune system, all children are treated empirically for infections in phase I. In Kenya, Amoxicillin is the first line antibiotic drug. Second-line antibiotic drugs, such as Gentamicin are used in certain situations, but if severe infection is present, they may be used as first-line antibiotic treatment.[9]

Table 1.2: Routine medication [10]

	Direct admission to SC treatment
Vitamin A*	One dose on admission One dose on discharge
Folic Acid	One dose on admission if there are definite signs of anaemia
Amoxicillin	Every day in phase I, plus 4 days during transition phase/phase II
Malaria	According to the national protocol
Measles > 6months old	1. One vaccine on admission if no vaccination card 2. One vaccine on discharge (after a month)
Iron	Add to F100 in phase II

**A child who received Vitamin A the previous month does not receive a dose on admission. Children with bilateral oedema are not given Vitamin A.*

Nutrition support in phase I involves the provision of F75, a milk-based formula, which helps to restore normal metabolic function and nutrition-electrolyte balance.[10] It provides about 75 calories per 100 ml of volume.[12] The use of this product aims to assist in the recovery phase and provide sufficient macro- and micro-nutrients for homeostasis. Initialising weight gain takes place only in phase II of recovery.

1.2.3.2 Transition phase

The transition phase takes two to three days, during which time therapeutic feeds are increased gradually but cautiously to avoid complications associated with overfeeding. F75 formula is substituted with F100 to provide about 130 kcal/day/kg from 100 kcal/kg/day. A child in the transition phase consumes about 30% more calories than

in phase I. Therefore, the child is expected to show some weight gain of about 6 g/kg/day.[11] A child whose oedema continues to increase, or who develops oedema, has signs of abdominal distension, experiences diarrhoea or develops complications that require intravenous infusion, is transferred back to phase I.

1.2.3.3 Phase II

The aim of Phase II is to achieve catch-up growth and correct micronutrient deficiencies. The volume of therapeutic feed in this phase is increased from 130 ml/kg/day to about 200 ml/kg/day. The child is discharged and referred to OTP when there has been no bilateral pitting oedema for ten days and the child has obtained a MUAC of > 11.5 cm or WHZ < –2SD. Also, the child should have regained their appetite.[10] If the caregiver and the child are absent for three consecutive days, they are regarded as defaulters.[9]

1.3 OUT-PATIENT THERAPEUTIC FEEDING PROGRAMME

Children with SAM, without medical complications are treated as out-patients in the community. The primary aim of OTP is to increase the accessibility and treatment of SAM in the community. Community health workers and community volunteers are trained on screening, monitoring and follow-up of SAM children within the community to make this programme run effectively.[11]

Table 1.3: Summary of admission criteria in OTP for severe acute malnutrition cases [4]

Criteria for admission	Out-patient therapeutic feeding programme
Anthropometric criteria	WHZ > –3 SD, MUAC <11.5 cm for > 6-month old children
Bilateral pitting oedema	Grade one (+)
Appetite test	Passes appetite test
Skin	No open skin lesions
Medical complications	No medical complications and child is alert

Bilateral pitting oedema, grade one, as indicated in table 1.3, refers to the presence of oedema on both feet.[11] An appetite test helps to determine whether the sick child would be able to be treated through regular weekly visits to OTP using a ready-to-use therapeutic feed (RUTF). The appetite test is conducted by providing RUTF to the child to consume with the help of the caregiver. The child is considered as having passed the appetite test if a third of the RUTF in the sachet provided has been consumed. If the child is unable to consume and tolerate RUTF, the child is referred to SC for stabilisation.[11,12]

A child that meets admission criteria is enrolled in OTP where medical and nutrition support is provided until discharge criteria are reached. The amount of RUTF consumed per day is determined by the weight of the child. The caregiver is expected to make weekly visits with the child to collect rations and have the child's progress assessed by the health worker. During weekly visits, all caregivers are given nutrition and health education.

Medical management in OTP sites involves provision of routine medications such as antibiotics, vitamin A supplementation, vaccinations against measles and deworming medication. Apart from the antibiotics, other medications are given as a single dose treatment in the presence of a health worker to ensure that drug administration and compliance are observed. The first dose of antibiotics is administered by the healthcare worker. The caregiver observes the administration of the first dose and thereafter administers the remaining doses.[12]

Table 1.4: Routine medication provided at OTP [4]

	Direct admission to OTP
Vitamin A	One dose on fourth week (do not give to the child with oedema)
Amoxicillin	First dose at OTP site and remainder of treatment administered by caregiver with instructions to give twice daily for 7 days at home
Malaria	According to the national protocol
Measles> 6 months old	One vaccine on fourth visit
Deworming > 1 year old	One dose (Mebendazole or Albendazole) on second visit

If a child fails the appetite test, which is conducted at every weekly return visit, develops oedema or oedema increases, the child is transferred to SC for intensive treatment. In addition, a child experiencing weight loss of more than 5% of body weight or developing a refeeding diarrhoea that can lead to loss of weight, needs to be transferred to SC. Children with SAM in OTP are considered cured if they are clinically alert and have no oedema for two consecutive visits. In addition, they should have gained about 15% of the admission weight.[4] However, to prevent relapse in these patients, it is recommended that they continue with OTP for a minimum of eight weeks, even if they meet discharge criteria before this period. Children who meet the discharge criteria are referred to the TSFP. A child who fails to turn up for two consecutive weekly visits is considered a defulater.[10]

1.4 TARGETED SUPPLEMENTARY FEEDING PROGRAMME

The Targeted supplementary feeding program (TSFP) aims to treat moderately acutely malnourished individuals in order to prevent deterioration of at-risk groups and to meet the additional nutrition needs of vulnerable groups such as under-fives, and pregnant and lactating women. At TSFP sites, children under five are screened and a nutritional diagnosis made. Medical treatment and nutritional support is provided according to the

diagnosis. Admission criteria for moderately malnourished children include WHZ <–2 to > –3SD and/or a MUAC of 11.5–12.4 cm.[12] In addition, there should be no presence of bilateral pitting oedema or any medical complications, and the child should have a good appetite.

Categories of admission include newly diagnosed moderate acute malnutrition (MAM) cases and referrals from OTP. Relapses are treated as new cases if they meet the admission criteria. A child with medical complications is referred to SC for treatment and then continues with nutrition support at the TSFP.[9] Nutrition support in TSFPs involves provision of a dry ration[1] that consists of the premixed food commodities to provide between 1000 kcal and 2000 kcal per day. [12]

Table 1.5: Food commodities and ration sizes for 14 days [12]

Ingredients	Amount/child/kg
Corn soy blend	3.5
Vegetable oil	0.35
Total	4.5

Medical treatment in the TSFP entails provision of routine medications such as vitamin A, iron and folic acid supplementation, immunisations, and anthelmintics. A child that who has received vitamin A supplementation in the previous month is not given vitamin A. A dosage of 6 mg/kg of iron is also administered for 14 days.

1.5 MONITORING AND EVALUATING INDICATORS IN SC AND OTP

Monitoring and evaluation of CMAM programmes, which include SC, OTP and TSFP, is often based on an international set of standards as outlined in the *Sphere Project*. *The Sphere Project* refers to a programme developed by the Steering Committee for Humanitarian Response, which comprises universal minimum standards that act as a point of reference when offering humanitarian assistance.[17] *Sphere Project* indicators for

[1] Dry ration is also referred to as take-home ration which food in dry form as opposed to wet ration or on-site feeding which refer to provision of cooked food or meals

nutrition programmes offering emergency response include: recovery rate, death rate, defaulter rate and coverage rate. These performance indicators help to monitor and evaluate CMAM programmes. According to Harmonized Training Package (HTP) Version 2, developed by the Emergency Nutrition Network (ENN) for the year 2011, a death rate of <10% in therapeutic centres (SC and OTP) and <3% in TSFP and a default rate of <15% are considered acceptable. CMAM coverage rates of > 50% in rural areas, > 70% in urban settings and > 90% in camps are also considered acceptable.[9]

Other important CMAM indicators are the average weight gain and average length of stay (LOS). An average weight gain of > 8 g/kg/day in SC or > 3 g/kg/day in TSFP is acceptable. Even though there is no internationally acceptable cut off for OTP, > 4 g/kg/day is considered acceptable.[9] Low average weight gain might suggest high absence rates, ineffective treatment, sharing of therapeutic feed or non-compliance with the treatment protocol. Length of stay refers to the amount of time taken by beneficiaries to reach discharge criteria. Relatively longer average lengths of stay may suggest frequent absenteeism, underlying medical complications or sharing of therapeutic feeds.[9] According to *Sphere Project* recommendations, the length of stay of SAM children in OTP is 56 days.

The average length of stay in in-patient care centres is 7–10 days before the recovered child is referred to OTP.[9] For OTP, the average length of stay is two months before referring the child to the SFP programme.[9] To date, inadequate studies have been conducted to determine the actual length of stay in CMAM programmes. However, in one study conducted by Irena *et al* [18] in Lusaka, Zambia among children with SAM admitted to SC, the median length of stay of the cohort participants was 10 days.

1.6 CLASSIFICATION OF CMAM DEFAULTERS

Beneficiaries who default on the CMAM programme can be divided into early defaulters and late defaulters. Early defaulters are CMAM beneficiaries who have had either one or no return visit, while late defaulters are beneficiaries who make two or more return

visits before missing the rest of the scheduled visits.[13] Case studies conducted by Velden in Burma, Ivory Coast, South Sudan and Darfur indicated that 35% of defaults occurred after the first visit while 20% of defaults occurred after the second visit.[13]

While there is limited research regarding defaulters in CMAM programmes, various humanitarian organisations involved in these programmes are able to provide some information on the issue. According to the *Sphere Project*, the long distances that need to be covered when visiting CMAM services, the security situation, the number of dependents left at home, the level of support offered to caregivers and the quality of care provided are all possible causes for defaulting. Defaults that occur close to the end of treatment are perceived to be due to caregivers considering their children to have recovered. On the other hand, early-stage defaulting may be the result of inadequate explanations of treatment and poor organisation of the therapeutic centres.[13] Statistics from non-governmental organisations operating CMAM programmes in 2000–2005 indicated that out of 30 programmes, 14 had a defaulter rate of more than 10%, while nine had a defaulter rate of more than 15%.[13]

1.6.1 Theory on defaulting and contributing factors

One theory for defaulting on health treatment is as a consequence of the individual's behaviour. The theory of planned behaviour suggests that factors surrounding an individual's health behaviour are based on one of three types of beliefs: behavioural belief, normative belief and control belief.[13]

Behavioural belief relates to the outcome of certain health behaviour. Caregivers' perceptions that turning up for the scheduled weekly visit in OTP would improve the child's condition are likely to reduce defaulting on the programme. Aspects that may influence behavioural belief include the caregivers' perceptions of malnutrition, their views on the treatment offered, communication of the treatment objectives and their understanding of the aim of the programme.[13]

Normative belief concerns normative expectations from the people around the caregiver, creating a subjective norm or perceived social pressure. Individuals around the child's caregiver may exert social pressure on caregivers which may have a positive or negative impact on seeking treatment and adherence to the treatment process.[13]

Control belief, also referred to as barriers, are factors that are likely to hinder positive health behaviour. They include distances to cover while walking to CMAM programme sites, the number of decentralised programme sites, the lifestyle of the population and insecurity.[13]

It has been found that most of the caregivers did not understand the actual condition that required their children to be admitted in the programme. They also did not understand the treatment objectives and were not aware that the child's weight gain was one of the treatment objectives. In addition, these studies found that caregivers did not know the duration of the SC and OTP programmes. Caregivers were only told to 'come back next week', without any explanation that they would be needed for several weeks until the child met the discharge criteria. These studies found that husbands and community members influenced normative beliefs. A case study at Darfur indicated that positive perceived social pressure came from people around caretakers, which promoted uptake of CMAM services.[13]

1.6.2 Case finding and defaulter tracing

Through outreach activities, community health workers and community volunteers are responsible for identifying acutely malnourished children within the community. The timely detection of SAM cases before complications develop makes treatment easier. Case finding is done at community level and at health facilities. There are two types of case finding: active case finding and passive case finding. Active case finding refers to the activity of identifying acutely malnourished cases in the community. Passive case finding refers to health workers identifying acutely malnourished children who visit a health facility for general consultations or routine visits. Where strong community mobilisation and participation exist, the rates of self-referral are high.[9,13] Normally,

community health workers and community volunteers in the CMAM programme have to make standard visits which involve visiting all children at OTP sites and following up on absentees and defaulters.[14] The purpose of follow-up visits to absentees is to find out reasons for missing weekly visits and to encourage caregivers to turn up for visits so that the children can complete the treatment.

1.7 CHALLENGES EXPERIENCED IN CMAM PROGRAMMES

The United Nations High Commissioner for Refugees (UNHCR) Health Information System statistics published in the 2011 indicated that children on therapeutic feeding programmes in Asia and Africa had an average weight gain of less than 8 g/kg/day. In addition, recovery rate indicators were poor. Asia had a recovery rate of <75%, with Bangladesh and Thailand having recovery rates of 69% and 57% respectively.[5] Africa, Djibouti and Kenya reflected recovery rates of 70% and 57% respectively. These low recovery rates were attributed to high default rates.[5]

According to the Centric Systematic Area Sampling Coverage Survey conducted in 2010 at Dadaab refugee camps, lack of information about CMAM services to caregivers was one of the major factors for poor coverage. This led to recommendations such as enhancing community understanding of the CMAM programme in certain aspects such as admission and discharge criteria and the importance of completing treatment.[20]

The Dadaab annual nutrition survey report for 2012 indicated that, Hagadera, Ifo, Dagahaley, Ifo 2 and Kambios refugee camps had global acute malnutrition (GAM) rates of 10.3%, 28.2%, 13.7%, 15.0 % and 17.1% respectively.[22]

Table 1.6: GAM and SAM rates in Dadaab refugee camps between 2011 and 2012 [22]

Camp	Hagadera	Ifo	Dagahaley	Ifo 2	Kambios
2012 GAM Rate*	10.3	28.2	13.7	15	17.1
2011 GAM Rate	17.2	22.4	23.2	N/A	N/A
2012 SAM Rate	3.2	10.1	4	5.1	6.4
2011 SAM Rate	4.6	6.8	-	-	-

All GAM and SAM rates expressed in percentage

The Dadaab nutrition survey report for 2011 indicated that CMAM coverage rates within the refugee camps were below *Sphere Project* standards.[22] It recommended identifying possible reasons for low coverage and suggested remedies for meeting *Sphere Project* standards.[17] According to the 2012 Dadaab nutrition survey report, the priority areas for immediate action included improving programme coverage, compliance and attendance within current security constraints.[22]

Some studies indicate that about half of the defaulters on the CMAM programme who leave shortly after admission do so because of poor communication to caregivers regarding the nature of the treatment, the required weekly visits and the discharge criteria. Besides this, caregivers do not seem to be appreciated and motivated to continue taking their children for treatment as per the treatment schedule.[19] This has been attributed to the lack of a patient-centred approach in CMAM programmes. In addition, non-adherence to the treatment procedures is likely to lengthen recovery periods on the programme, resulting in an increased default rate.

1.8 PATIENT-CENTRED APPROACH

The concept of patient-centred care (PCC) or a patient-centred approach has become recognised as a link to quality of care. PCC is a concept that evolved barely two decades ago in the domain of healthcare consumerism. It refers to the respect and response given to the preferences, values and needs of individual patients and the incorporation of patients' values in clinical decisions. Improved communication,

appropriate intervention, patients' reported biomedical outcomes and enhanced satisfaction are some of the main components that characterise patient-centred care.[24]

A patient-centred approach is associated with reduced average length of stay, increased efficiency and efficacy of treatment, and enhanced patient satisfaction. It is argued that for a patient-centred approach to be effective, healthcare providers have to be prepared to ensure shared knowledge, education and the free flow of information. Research studies reveal that continuity of care and effective communication are the key components of a patient-centred approach.

Health workers require special skills to competently offer patient-centred care.[24] For example, for a doctor to accurately diagnose a patient's condition, requires the identification of antecedents, mediators and triggers. For this to be successful, understanding only the disease and symptoms is not sufficient; it is also necessary to understand beliefs, environment, dietary habits, social and psychological functions and risk factors. This is possible through patient-centred communication which enables a health worker to understand a patient's perspective. Patient-centred communication enhances a collaborative partnership between a health worker and a patient that promotes patient participation in decision-making, which in turn leads to improved outcomes and satisfaction.[24]

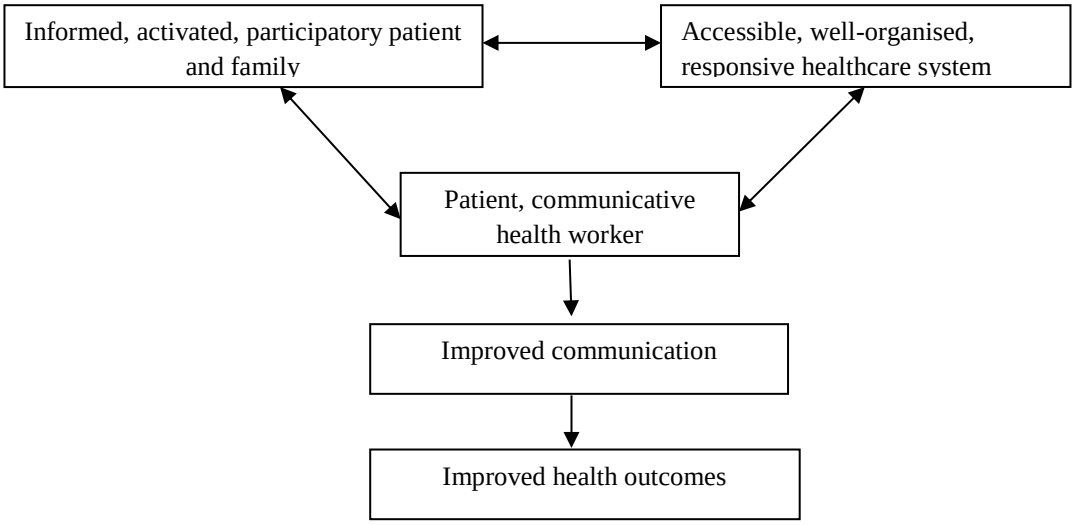


Figure 1:3: Patient-centred communication model [24]

In order to facilitate effective communication in patient-centred care, health workers must be able to monitor and consciously adapt their communication according to each patient's needs. One simple way to adapt communication is by presenting information at a level that the patient is able to understand. By observing non-verbal cues, the health worker can detect if the patient has understood the information provided and may need to restate or paraphrase it. In addition, regular assessment of patient understanding is necessary to identify whether adaptive communication is necessary.[24]

Improved health outcomes and patient satisfaction are the result of effective patient-centred communication. Patients' satisfaction over the recent past has been used as an indicator of quality care in health settings. In the case of patients who are not able to express themselves (such as patients with mental impairments, the elderly and children), caregivers' or relatives' views are used to express the patient's satisfaction. In the paediatric domain, several studies on parents' satisfaction on the medical care provided to their child have been carried out. Most of these studies have focused on health workers' communication, parental involvement in the medical care of their children as well as the importance of parents' satisfaction and compliance with medical

regimens. Overwhelming research evidence indicates that increased knowledge and information on medical treatment builds confidence in parents and hence their compliance to the treatment.[23,24]

There is significant number of studies available on pediatric clinical settigs on patient-centered care such as parental involvent in medical care of their children, their satisfaction and compliance to regimen. However, there has been limited attention on patience centered care in treatment of severe acute malnutrition in children in emergency nutrition settings. No previous study were found on patient centered care in emergency nutrition settings focusing on caregivers' knowledge on treatment of children with SAM nor caregivers perceptions on quality of health care services and how these affect treatment outcomes.

1.9 MOTIVATION FOR THE STUDY

From the reviewed literature, it is clear that there have been great improvements in management of severe acute malnutrition through the evolution of the CMAM model. However, some CMAM programmes continue to experience low recovery rates and increased default rates, especially in populations living within refugee camps. It is evident that the caregivers who accompany children with SAM to get CMAM services play an important role in promoting recovery.[5] However, there are limited studies that elucidate the role of caregivers in the recovery of severely acutely malnourished children, and the factors promoting their participation that may contribute to increased performance of CMAM programmes.

The proposed research study sought to find out the role of caregivers in the recovery of severely acutely malnourished children in CMAM programmes and possible factors that promote their participation in CMAM services. This research aims to contribute to the body of knowledge in emergency nutrition and provide insights into the effect of caregivers' knowledge on SAM treatment and its relationship to the recovery period and default rates of SAM cases. The findings of this study aim to inform humanitarian agencies and governments in developing comprehensive CMAM guidelines that

recognise the indispensable role played by caregivers accompanying SAM children, thereby enhancing the effectiveness of CMAM programmes in reducing child mortality.

CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY

2.1 INTRODUCTION

This section presents the study design, objectives, hypothesis, study settings, sample size and sample selection, subject recruitment, measurements, methods and instruments, statistical analysis, and ethical and legal aspects of the study.

2.2 RESEARCH QUESTION

Does a relationship exist between caregivers' knowledge of treatment objectives and the default rates of children with severe acute malnutrition in community-based programmes?

2.3 AIM OF INVESTIGATION

To determine the relationship between caregivers' knowledge of treatment objectives and default rates of children with severe acute malnutrition in community-based programmes.

2.4 OBJECTIVES

2.4.1 Primary objective

To determine the relationship between caregivers' knowledge of treatment objectives and the default rates of children with severe acute malnutrition (SAM) in community-based programmes.

2.4.2 Secondary objectives

i. To assess caregivers' knowledge of medical and nutrition treatment objectives in stabilisation centres (SC) and out-patient therapeutic feeding programmes (OTP).
ii. To examine the default rates of children wii with severe acute malnutrition in the recovery phase in SC and at OTP.

iii. To determine the length of stay of children with severe acute malnutrition in SC and at OTP.*

iv. To evaluate caregivers' perceptions of the quality of care provided at SC and OTP.

**For the purposes of this study, length of stay is defined as the amount of time taken by acutely severely malnourished children in SC and OTP to meet the discharge criteria.*

2.5 RESEARCH NULL HYPOTHESIS

H_0: A relationship does not exist between caregivers' knowledge of treatment and default rates of children with SAM in SC and OTP.

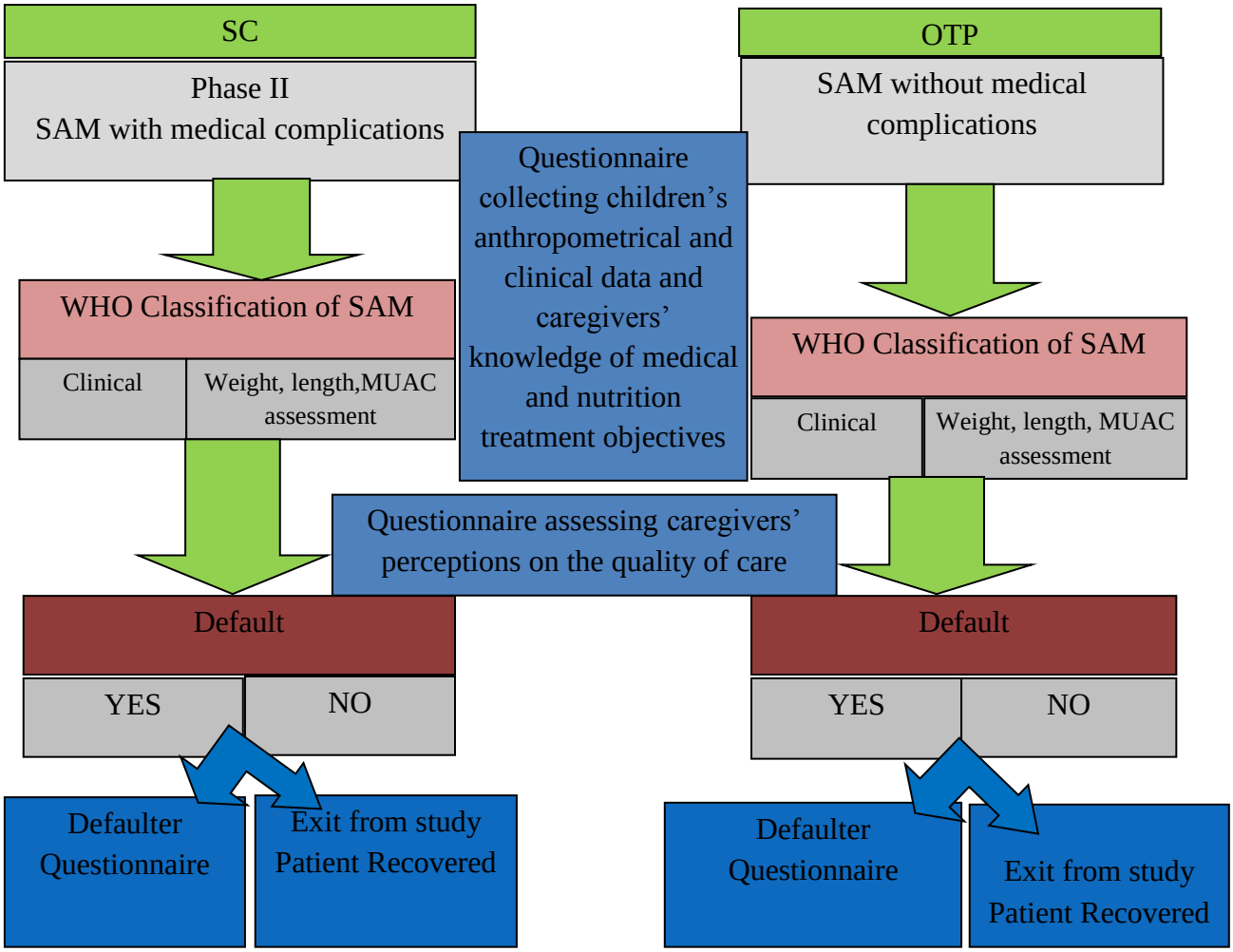


Figure 2:1: Conceptual framework

2.6 SETTING

The study was conducted at the Dadaab Refugee Complex, which is located in the north eastern parts of Kenya at Garissa County. It is situated about 500 km from Nairobi and 80 km from the border of Somalia.[21] It initially constituted three refugee camps, Ifo, Hagadera and Dagahaley, which cover an area of 50 square kilometres. The region is semi-arid and was formerly rangeland for pastoralists before the refugee camps were established between 1991 and 1992 to serve as asylum for refugees predominantly from Somalia. By November 2011, Dadaab Refugee Complex had 453 277 registered refugees.[1] Due to the increased influx of refugees, two more sites, Ifo Extension and

Kambios, were established in 2015 to ease congestion, bringing the total to five refugee camps. However, Kambios and Ifo Extension are not officially recognised as new refugee camps in the Republic of Kenya. The majority of refugees in Dadaab Refugee Complex are Somali nationals.[21] Out of three officially recognised refugee camps, two were randomly selected for the purposes of this study: Ifo and Hagadera refugee camps.

In response to the prevalence of severe acute malnutrition (SAM), agencies providing health and nutrition services in the refugee camps have set up SCs for the management of SAM with medical complications. In addition, these agencies have set up OTPs for treatment of severe acute malnutrition without medical complications. There were five OTP sites and one SC in each of the two refugee camps selected for this study.

Figure 2:2: Map showing location of Dadaab refugee camps Latitude 0.0551030 and longitude 40.3146740[25]

2.7 STUDY DESIGN

The study used a cohort study design as it is suitable for determining any relationship between exposure and outcome of interest. It allows the researcher to follow the study participant groups through time to compare the incidence of outcome of interest in each of these groups.[22] In SC, only children who were in phase II were recruited because, according to the WHO ten steps in treatment of severe acute malnutrition, this is where catch-up growth is achieved and requires aggressive nutrition support. Children in OTP were followed up from the second weekly visit until they met the discharge criteria.

2.8 SAMPLE SIZE

The sample size was determined with the assistance of a statistician from the Centre for Statistical Consultation, Stellenbosch University. The total target population of malnourished children receiving treatment before the start of the study in both SC and OTP was 943. For a small population such as this, by choosing power at 5% the required sample size was 106 children from both SC and OTP. Factoring in an attrition rate of 20% to cater for possible loss to follow-up, which is considered an acceptable rate for cohort studies, the final sample size was 128 children.[7] Each of the refugee camps was allocated half of the total sample size. In each refugee camp there were three study sites, one SC and two OTPs, which were assigned an almost equal number of study participants as follows:

- Twenty-two children in SC from Ifo and twenty-two children in SC from Hagadera refugee camps were selected.
- Twenty-one children from each of two OTPs at Ifo and twenty-one children from each of the two OTPs at Hagadera refugee camps were selected.

2.8.1 Sample selection

All eligible children in the stabilisation centres for both refugee camps were interviewed until the required sample size was obtained. Also, in the four OTPs, all eligible study participants were recruited until the required sample size was obtained. The following inclusion and exclusion criteria applied:

2.8.1.1 Inclusion criteria

The target population eligible for this study was:

i. Severely acutely malnourished children aged between 6 and 59 months based on a cut-off MUAC of <11.5cm or WFH *z*-score ≥ –3SD, with medical complications, admitted in SC, who were in phase II.
ii. Severely acutely malnourished children aged between 6 and 59 months based on a cut-off MUAC of <11.5cm or WFH *z*-score <–3SD with no medical complications who were in their second weekly visit in OTP.
iii. Caregivers with children who met inclusion criteria in (i) or (ii) above.

For the purposes of this study, participants in the second weekly visit in OTP were selected to provide the researcher with sufficient time to screen for eligible participants.

2.8.1.2 Exclusion Criteria

The following exclusion criteria applied:

i. Severely acutely malnourished children and caregivers who did not reside in Ifo and Hagadera refugee camps.
ii. Caregivers who declined to provide informed consent and their SAM children.

2.9 SUBJECT RECRUITMENT

All newly severely acutely malnourished children admitted to SC and OTP were eligible to participate in the study. The researcher used the inclusion criteria screening tool to recruit study participants. Only caregivers who consented to voluntarily participate in the study were included in the study together with their children.

i. Data collection of SC children started once these children reached phase II of nutritional rehabilitation. Research assistants worked closely with the nutrition nurse in-charge of the SC to identify children who had reached phase II.
ii. Data collection in OTP started in the second weekly visit. The first weekly visit, during which admission at OTP was done, was used to identify all eligible study participants in OTP.

2.10 METHODOLOGIES: MEASUREMENTS, METHODS AND INSTRUMENTS

With the help of research assistants, data from children and their caregivers was obtained using structured questionnaires (Appendices A, B, C and D). Research assistants were standardised for all study procedures.

2.10.1 Measurements and Methods

2.10.1.1 Data of children in SC and OTP

Research assistants collected the following data from all children with SAM who had reached phase II in SC, using three questionnaires namely: Questionnaire 1-SC (Appendix A), Questionnaire 2-SC (Appendix B) and Questionnaire 3-SC (Appendix C). They also collected data from all children who attended their second weekly visit in OTP using three questionnaires: Questionnaire 1-OTP (Appendix D), Questionnaire 2-OTP (Appendix E) and Questionnaire 3-SC/OTP (Appendix C).

Questionnaire 1 –in SC and OTP (Appendices A and D)

This research instrument collected data in three sections:-.

Part I: Child's and caregivers' social demographic data

This section collected data on the caregiver's age, gender, education level, relationship to the child, child's age, gender and number of child's siblings. (Appendices A and D)

Part II: Clinical and anthropometric assessment

This section also captured clinical assessment data which included the type of malnutrition diagnosis and presence of nutritional oedema and its grade at admission. Questionnaire 1 –OTP (Appendix D) consisted of additional data which included the type of routine medication given at home and its dosage. While nutritional oedema assessment was done daily in SC, it was conducted on weekly basis in OTP.

For the purpose of this study, children who presented with bilateral pitting oedema were categorised as having kwashiorkor, a form severe acute malnutrition, while children who presented with circumference MUAC of <11.5 cm and/or *z*-score <–3SD without

bilateral pitting oedema were categorised as having marasmus, another form of severe acute malnutrition. Though these terminologies are not currently used in the WHO classification of acute malnutrition, they are still commonly used in the refugee camps where data was collected.

Research assistants retrieved SAM children's anthropometric admission criteria data from their medical files which included weight, length/height and MUAC measurements. In SC, weight measurements were taken daily while in OTP they were taken on weekly basis. However, MUAC measurements were taken after seven days while height measurements after 21 days in both SC and OTP. In the case of children with nutritional oedema, their weight measurements were taken and corrected accordingly. Weight, height and MUAC measurement procedures took a maximum of five minutes each (Appendices A and D).

The following are anthropometric data collected from SC and OTP using following procedures:-

Weight:

Weight for children with SAM in Phase II was taken on a daily basis at SC by the research assistants. The following procedures were used to weigh participants less than two years old:

- An electric scale with an accuracy of 0.001 kg was used for weighing the child participant.
- The scale was placed on a flat, hard surface and calibrated to zero before weighing began. A paper towel was placed on the scale and, while ensuring the child's safety, the child was placed in the middle of the scale.
- The child was weighed wearing very light clothing.
- The child was allowed to sit or lie down on the scale, with minimal movement, until the weight was displayed.
- The measurements were read to the nearest 0.001 kg.
- The average of three measurements was taken.

- The weight was recorded on the data capture sheet.
- The scale was always disinfected before and after use.[3]

Methods used for weighing children older than two years using a standing scale:

- An electric scale with an accuracy of 0.001 kg was used to weigh children while standing.
- The scale was placed on a flat, hard surface and calibrated to zero before beginning the measurements.
- The scale was disinfected before and after use.
- The child participant was weighed while in light clothing.
- While ensuring the safety of the child, the child was made to stand evenly on the scale with arms hanging down the sides, without moving until the weight display was stable and locked.
- The measurements were read to the nearest 0.001 kg.
- The average of three measurements was taken.[3]
- The weight was recorded on the data capture sheet.

Mid-upper arm circumference:

MUAC measurements of all eligible children were taken on a weekly basis.

Method for taking mid-upper arm circumference measurements:

- Arm circumference was measured using a non-stretchable measuring tape.
- Child participants who were able to stand were requested to stand upright with arms hanging freely at the sides of the trunk, palms facing the thighs.
- Children who were unable to stand, such as infants, were held by their caregivers while in a seated position with their left arm hanging freely.
- Caregivers were requested to ensure children had loose clothing without sleeves, to allow total exposure of the arm and shoulder area.
- While the caregiver calmed the child participant in order to locate the mid-upper arm midpoint, the research assistant flexed the child participant's elbow to 90° with the palm facing upward.

- Then the research assistant located the lateral tip of the acromion at the shoulder, and a small mark was made at the identified point.
- This was followed by locating most distal point – the olecranon process of the ulna (at the point of the elbow) and marked.
- A measuring tape was placed over these two marks (lateral tip of the acromion at the shoulder and the olecranon process of the ulna) and was used to find the mid-upper arm between them, and a small mark was made at the identified point
- Lastly, the child participant's arm was made to relax, the elbow extended and hanging just away from the side of the trunk, and the palm towards the thigh, the tape was placed around the arm and positioned perpendicular to the long axis of the arm at the marked point. With the tape snug to the skin, but not compressing soft tissues, the circumference was recorded to the nearest 0.1 cm.[10]

Length/ height:

Depending on the child's age and ability to stand, either the length or height of the child was measured. In SC, height or length measurements were taken twice – during admission and at discharge. For children under the age of two years, their length was measured while they were lying down (recumbent length) using a length board. Children who were two years old or older had their heights measured using a height board. However, children less than two years old or above this age but unable to stand, had their recumbent length measured. The length measured was adjusted by adding 0.7 cm to convert it to a height measurement according to the WHO growth standard.[10]

A UNICEF height board was used as a length board by placing the back of its calibrated side on a flat stable surface, such as a table, and with the movable footboard and fixed headboard facing upward. While in this position, the participant was placed in a lying position on the calibrated flat surface of the board with his or her head facing upward and touching the fixed headboard and feet on the sliding board.

Methods to determine length of children under the age of two years or those who were above two years of age but unable to stand:

- The child's shoes, socks and other clothing were removed to ensure minimal clothing. If the child was naked, a diaper was used to avoid getting the length board wet.
- The length board was covered with a thin soft cloth or soft paper for hygiene and for the infant's comfort.
- The child was placed in a lying position in the middle of the board.
- An explanation was given to the caregiver whose help was enlisted to place the baby on the length board and assist in holding the baby's head in place while the measurer took the length measurement.
- The caregiver laid the child on the back with the head against the fixed headboard and just compressed the hair.
- The head was positioned such that an imaginary vertical line from the ear canal to the lower border of the eye socket (Frankfort plane) was perpendicular to the board, with eyes looking straight up and the caregiver was requested to hold the child's head in this position.
- The research assistant moved to the side of the movable footboard towards the side where the measuring tape was fixed.
- The research assistant ensured that the child was lying straight along the board, shoulder touching the board, and the spine not arching.
- The research assistant held down the child's legs with one hand while applying gentle pressure to the knees to straighten the legs as far as they could without causing any harm, and moving the footboard with the other.
- While holding the knees, the footboard was moved towards the child's feet so that the soles of the feet were flat against the foot board and the toes were pointing upwards.
- Measurements were read in centimetres to the nearest 0.1 cm and recorded on the data capture sheet.[10]
- The average of three measurements was taken.

Note: In the case of children who were two years old or above, measurements were corrected by subtracting 0.7 cm from the length to record the results as height.

Instructions for measuring height for children above two years of age:

- The height board was place on even, firm, level ground.
- The child's shoes and socks were removed as well as child's head gear or any hair ornaments.
- The caregiver was enlisted to assist in measuring the child's height.
- The research assistant helped the child to step on the baseboard and stand with feet slightly apart.
- The child was positioned in an upright position with the head, shoulder blades, buttocks, calves and heels all touching the vertical board.
- The caregiver was requested to hold the child's knees and ankles to straighten the legs and keep feet flat, with heels and calves touching the vertical board while keeping the child calm.
- The child's head was positioned such that it was aligned in the Frankfort plane. To keep the head in this position, the measurer held the bridge between his or her thumb and forefinger over the child's chin.
- The research assistant gently pushed the child's stomach in to help the child to stand at full height.
- While keeping the head in position, the research assistant used the other hand to pull the movable headboard down towards the child's head for it to rest firmly on top of the head, compressing the hair gently.
- The height measurements were read and recorded in centimetres to the nearest 0.1 cm on the data capture sheet .[10]
- The average of three measurements was taken.

Part III: Assessment of caregivers' knowledge of medical and nutrition treatment objectives

These questionnaires gathered data that sought to determine if caregivers were aware of the main objectives of the medical and nutrition treatment given to their children. It assessed if the caregivers understood the nature of the condition their children were suffering from and their perceptions of the child's condition. In addition, they gathered data examining whether caregivers knew their children's targeted weight and expected

exit MUAC reading as well as expected duration of stay on the programme while receiving the treatment (Appendices A and D).

In order to obtain nutrition data caregivers were assessed if they knew the type of RUTFs their children were receiving, ration size, frequency of feed and if they gave other feeds apart from therapeutic feeds prescribed. The research assistants observed the type of therapeutic feed, amount and frequency caregivers gave to their children and recorded. Questionnaire 1- OTP (Appendix D) had additional data on appetite test status which was conducted in OTP. All these data was capture daily in SC and on weekly basis in OTP (Appendices A and D).

Questionnaire 2: Questionnaire 2- in SC and OTP (Appendix B and E)

These questionnaires collected data on caregivers' perceptions of the quality of care. Data such as caregiver's perceptions of the healthcare process and staff attitudes during healthcare service delivery, as well as their perceptions of the staff work environment were collected.

Questionnaire 3: Questionnaire 3-SC/OTP (Appendix C)

This research instrument collected data on children who had defaulted and it was the same for SC and OTP. However, defaulters are defined differently in SC and OTP. A child is referred to as a defaulter in SC if absent for three consecutive days.[9] In OTP, a child who misses two consecutive weekly visits is considered as defaulter.[10] Children who defaulted during the period of study were assessed to find out possible reasons for defaulting. Admission details such as the name of the child, registration number on the programme, caregiver's name and the block number where the household of the child was situated were recorded. Research assistants used these details to trace the defaulted child together with the caregiver. Once the defaulted children had been traced, their weight and MUAC measurements, duration of time spent on the programme and targeted weight was recorded. In addition, caregivers were interviewed to investigate possible reasons for defaulting (Appendix C).

2.10.2 Instruments

This section provides a brief summary of research instruments used in this study. A detailed explanation of the data contained in each of the three research instruments has been provided in section 2.1.1.1. Only main differences in these research instruments used in SC and OTP have been highlighted. A rationale on how 'Caregivers' perceptions of quality of care assessment questionnaire' was developed has been given**.** Also, estimated time used to complete each of the questionnaires has been stated.

Questionnaire 1 –in SC and OTP (Appendix A and D)

These two research instruments collected data on anthropometric and clinical assessment and caregiver's knowledge assessment on medical and nutrition treatment objectives questionnaire.

Questionnaire 1- OTP (Appendix D) differed slightly from Questionnaire 1- SC (Appendix A) in that it contained additional data on child's appetite test status, action taken with respect to appetite test status such as continuation of treatment or referral to SC and type of routine medication given at home and the dosage given (Appendices A and D). It took a maximum of 15 minutes to complete each of these questionnaires and it was done only once during the study period.

Questionnaire 2- in SC and OTP (Appendix B and E)

In order for this study to assess the level of patient-centred communication in SC and OTP, which is an important component of patient-centred care[19], the caregivers' perceptions of the quality of care acts as a good proxy indicator.[3] Therefore, an instrument for measuring parent satisfaction on paediatric care formulated by Arnetz and Ygge, 2001, was adapted to develop these research instruments to assess caregivers' perceptions of the quality of care.[26]

While Questionnaire 2- in SC (Appendix B) collected some data based on daily health care activities, Questionnaire 2- OTP (Appendix E) collected some data that depended

on weekly visits conducted in OTP. This questionnaire took a maximum of 15 minutes to complete and was administered to caregivers during the first week of stay in SC and just before discharge in OTP.

Questionnaire 3- in SC and OTP (Appendix C)

There was no difference in terms of data which this research instrument collected in SC and OTP. It was estimated to take 15 minutes to complete.

2.11 DATA COLLECTION

Before data collection, the investigator conducted two days' training of eight research assistants. The training covered standardised interview procedures, correct taking of weight, height, length and MUAC measurements, research ethics and data recording in order to enhance the reliability and validity of data collected. Research assistants were remunerated for the days they worked during data collection. In the SC, data was collected on a daily basis from the time children entered phase II until they were discharged. However, at OTP centres, data was collected on a weekly basis according to children's scheduled weekly visits, starting on the second weekly visit.

2.12 PILOT STUDY

A pilot study was conducted at Ifo II Extension and Dadaab refugee camps, which was managed by Kenya Red Cross. This site was purposely selected because it had a population with similar characteristics as the population of study. In order to determine an adequate sample size, the statistician from the Centre for Statistical Consultation, Stellenbosch University was consulted and a sample size of 10% of the total sample was considered adequate for the pilot study. The total sample size for the pilot study was 13 children, five from SC and four from each of the two OTP sites from the selected refugee camps. This sample was not included in the final research study findings.

Before starting the pilot study, two experts in emergency nutrition involved in the management of SAM in children were given the questionnaire to assess the content and face validity, and to provide further recommendations. The assessment of face validity

was reinforced during the research assistants' training and any identified gaps were addressed before starting the actual study.

Before carrying out pilot study, one day training was conducted to twelve research assistants. The training contents included appropiriate filling in of questionaires, correct taking of weight, height and MUAC measurements to ensure good quality of data collect. During the pilot study, which took two days, the researcher and research assistants visited selected SC sites and OTP sites and identified children who met eligibility criteria for the study. Caregivers of the children who met eligibility criteria were explained the nature of the study, and their consent to participate in the study was sought. Caregivers who voluntarily consented to participate were included in the study. Research assistants used questionnaires to obtain demographic, clinical and anthropometric data from the children. Questionnaires on caregivers' knowledge and feedback on the quality of care were administered to the caregivers. In addition, questionnaires were administered to children who were identified as defaulters during the time of the pilot study.

2.13 DATA CAPTURING

Data such as the child's date of admission, age, sex, anthropometric admission criteria, type of acute malnutrition, targeted weight, daily weight gain, routine medication administered and discharge criteria were captured on a Microsoft Excel spreadsheet. The questionnaires were coded and captured on MS Excel.

2.14 DATA ANALYSIS

After data collection, data was cross-checked to identify any possible errors before proceeding to data entry. The coded data was entered into an MS Excel spreadsheet and data cleaning done before proceeding to data analysis. Descriptive statistics such as percentages, mean, median and standard deviation were used to summarise entered data.[3] In order to calculate caregivers' knowledge of treatment objectives, a percentage score was derived from the four questions on the caregivers' knowledge of medical and nutrition objectives by getting the sum of all the correct and positive responses, then

dividing by total responses of 128 caregivers and multiplying by a hundred. A Likert scale, with assigned percentage scores of 0–25% rated poor, 26%–50% rated fair, 51%–74% rated good, and 75%+ rated excellent, was used to give an overall rating.

2.15 STATISTICAL ANALYSIS

Data was captured using MS Excel and SPSS version 11 was used to analyse the data. Summary statistics were employed to describe the study variables. Frequency tables and cross-tabulations were used to present the distributions of variables. Means and medians were used as the measure of central location for ordinal and continuous data while standard deviations were used as indicators of spread. The relationship between two continuous variables, such as average weight gain and length of stay, was analysed using regression analysis and the strength of the relationship measured was determined using Pearson or Spearman correlations for the continuous variables, which were not normally distributed. For continuous response variables related to several other continuous input variables, multiple regression analysis was used and the strength of their relationship was determined using multiple correlations.[27]

In order to compare between ordinal response variables and nominal input variables, a non-parametric ANOVA method was applied. The relationship between nominal variables was investigated using contingency tables and appropriate chi-square tests such as ratio chi-square or the McNemar test. [27,28] A p-value of $p < 0.05$ represented statistical significance in hypothesis testing and 95% confidence intervals were used to describe the estimation of unknown parameters.

2.16 ETHICAL AND LEGAL ASPECTS OF THE STUDY

Before proceeding with the study, ethics approval was sought from the Health Research Ethics Committee at Stellenbosch University (Appendix H). The study was approved under Ethics Reference No.S14/06/133. This was followed by obtaining ethical approval from Kenyatta University under application number PKU/307/E283 (Appendix I). The study was licensed by the National Commission of Science Technology and Innovation in Kenya with permit number NACOSTI/P/15/4871/5678 (Appendix J). At field study

sites, permission was sought from the Department of Refugee Affairs, International Rescue Committee (IRC) Kenya, Islamic Relief of Kenya and Kenya Red Cross (Appendices K, L, M and N). Consent forms were available in English and Somali (Appendices F and G) so that caregivers would understand that their participation in the study was entirely voluntary.[29]

Participants' names were not recorded during data collection. However, they were allocated unique numbers to ensure confidentiality. Questionnaires had only unique codes to facilitate data analysis. Collected data and data analysis was only handled by authorised individuals.[30] In order to protect the confidentiality of participation among study participants anonymization of their data was done. The relevant authorities will be consulted before publishing any part of this research study.

CHAPTER 3: RESULTS

3.1 INTRODUCTION

This section presents an analysis of the study findings and, after the description of the study participants' characteristics, is arranged according to the objectives of the study.

3.2 DESCRIPTION OF STUDY PARTICIPANTS' CHARACTERISTICS

A total of 128 children who met the inclusion criteria, together with their caregivers, were included in the study. The two refugee camps (Ifo and Hagadera) contributed equally to the total sample. Each refugee camp contributed a sample of 64 children, 22 of whom were drawn from stabilisation centre (SC) and 42 children from two out-patient therapeutic feeding programmes (OTPs). This yielded an overall sample of 84 children from OTP and 44 children from SC. No parents whose children were eligible to participate declined to consent to be entered into the study. No study participants were lost to follow-up in the entire study period.

Most of the participants were female, with 63.4% ($n = 28$) from SC and 59.5% ($n = 50$) from OTP. Most of the children in SC and OTP, 81.8% and 91.7%, respectively, were between the ages of six and 23 months. The average age of the caregivers in SC was 27.8 years (±5 years) while in OTP it was 27.4 years (±7.1 years). In the majority of cases the mothers brought their children for treatment in both SC and OTP ($n = 42$; 95.5% and $n = 82$; 97.6% respectively). The highest level of education caregivers had obtained was primary school, with 56.8% ($n = 25$) of the caregivers in SC having had a formal education (primary school) compared to those in OTP at 26.2% ($n = 22$). There was no significant relationship between caregivers' education and length of stay. (Table 3.1)

Table 3.1: Study participants' socio-demographic characteristics

Participants' socio-demographic characteristics							
n = 128							
Stabilisation Centre							
n = 44							
Child		%	Min	Max	Median	Mean	SD
	Male	36.4					
	Female	63.4					
	Age in months		6	46	12		
	6–23 months	81.8					
	24–59 months	18.2					
	Number of siblings		1	9	4		
Caregiver	Age in years					27.8	5
	Male	2.3					
	Female	97.7					
	Relationship						
	Mother	95.5					
	Father	4.5					
	Education						
	Informal	43.2					
	Primary school	56.8					
Out-patient Therapeutic Programme							
	n = 84						
Child	Male	40.5					
	Female	59.5					
	Age in months		6	57	10		
	6–23 months	91.7					
	24–59 months	8.3					
	Number of siblings		0	11	4		

Caregiver		%	Min	Max	Median	Mean	SD
	Age in years					27.4	7.1
	Male	2.4					
	Female	97.6					
	Relationship						
	Mother	97.6					
	Father	1.2					
	Grandmother	1.2					
	Education						
	Informal	73.8					
	Primary school	26.2					

Children admitted to both SC and OTP had average MUAC measurements of 10.8 cm (±1.2 cm) and 11.1 cm (±0.5 cm) respectively. This was found to be within the recommended admission MUAC criteria set by the World Health Organization, of <11.5 cm for severe acute malnutrition.[1] Only in the SC did children have nutritional oedema (11.4%; $n = 5$). The most common type of severe acute malnutrition was marasmus. See table 3.2 below.

Table 3.2: Study participants' nutrition status on admission

Participants' nutrition status on admission			
$n = 128$	%	Mean	SD
Stabilisation Centre ($n = 44$)			
Admission MUAC		10.8	1.2
Marasmus	86.4		
Kwashiorkor	13.6		
Nutritional oedema	11.4		
Oedema Grade++	11.4		
Out-patient therapeutic feeding programme ($n = 84$)			
Admission MUAC		11.1	0.5
Marasmus	98.8		
Kwashiorkor	1.2		
Nutritional oedema	0		

3.3 CAREGIVERS' KNOWLEDGE OF TREATMENT OBJECTIVES IN CMAM PROGRAMMES

This section provides an analysis of the questions that assessed the caregivers' knowledge of medical and nutrition treatment objectives, which were: 1) Whether the caregiver knew the reason for the child's admission; 2) Whether the caregiver knew the duration of treatment; 3) Whether the caregiver knew the prescribed quantities and the frequency of therapeutic feeds prescribed; 4) Whether the caregiver gave the child any other feed besides the prescribed therapeutic feeds; 5) Whether the caregiver knew the correct dosage of routine medication administration; 6) Whether the caregiver knew the reason for keeping children warm at night and during cold weather.

When the caregivers were questioned on whether they knew the reason for their child's admission to a community-based management of acute malnutrition (CMAM) centre, only 43.2% ($n = 19$) of caregivers in the SC responded in the affirmative, while 91.7% ($n = 77$) of caregivers in OTP knew why their children had been admitted. Comparing this response between the two camps, 76.6% ($n = 49$) and 73.4% ($n = 47$) of caregivers from Ifo and Hagadera, respectively, stated that they knew the reasons why their children had been admitted.

Among the caregivers who knew the reasons why their children had been admitted in SC, 18 (94.7%) stated that their children had been admitted because they were malnourished, while one caregiver (2.3%) stated that her child had been admitted because the child was sick. In OTP, 60 caregivers (71.4%) responded that their children had been admitted because they were malnourished, while 17 (22.1%) of the caregivers stated that their children had been admitted because they were sick. In Ifo refugee camp, all the caregivers responded that their children had been admitted because they were malnourished, while in Hagadera, 29 (61.7%) responded that the reason for their children's admission was malnutrition, and 18 caregivers (38.3%) stated that their children had been admitted because they were sick. In cases where the caregiver stated that the child was sick, no reference was made to a nutritional inadequacy.Figure 3.1.

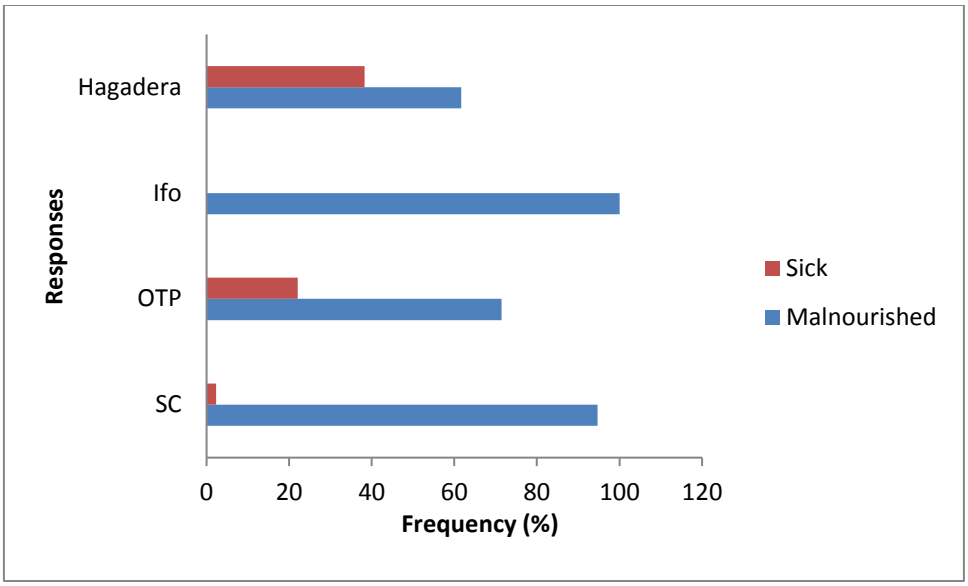


Figure 3:1 Caregivers' reasons why their children were admitted

When caregivers were asked the duration they expected for their children's treatment in the program, 36 caregivers (82%) from SC and 36 (38.1%) from OTP did not know the how long the treatment would take. However, 31 of the caregivers from OTP (36.9%) did not expect their children to require treatment for more than one month while eight caregivers (18.2%) from SC did not anticipate their children would spend more than two weeks on the CMAM programme. Across the refugee camps, 50.8% ($n = 33$) and 55.6% ($n = 36$) of caregivers from Ifo and Hagadera refugee camps, respectively, stated that they did not know the amount of time their children would take to complete treatment (Figure 3.2).

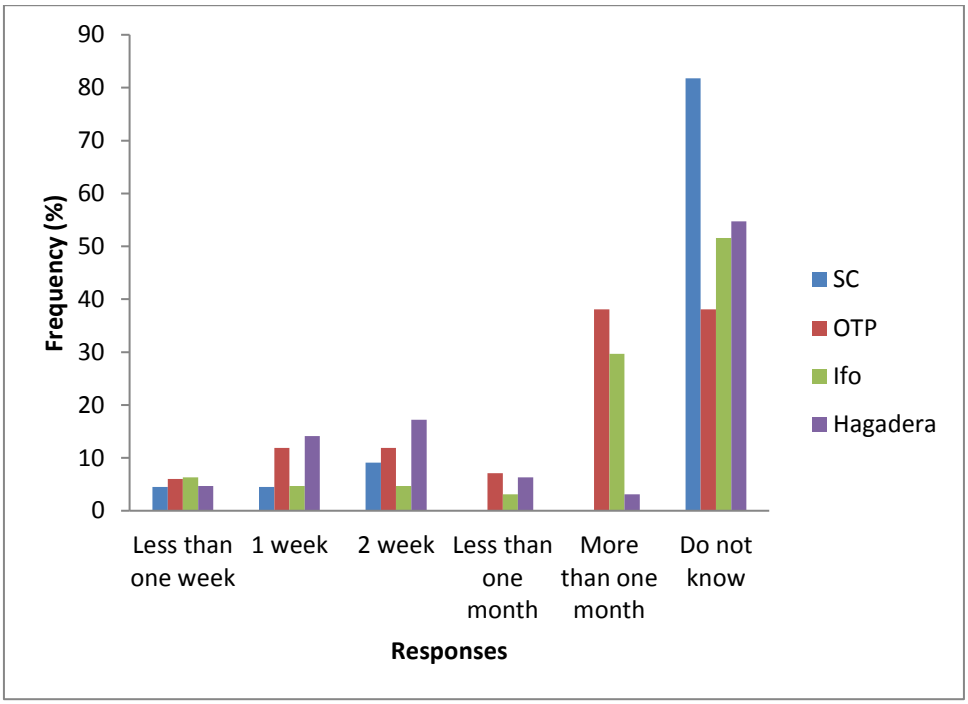


Figure 3:2 Caregivers' responses on duration they expected for their children's treatment in the program

Caregivers were asked if they could remember the quantities of therapeutic feeds prescribed to their children. In the SC, 34.1% ($n = 15$) of the caregivers and 79.8% ($n = 67$) of the caregivers at OTP stated that they could remember the quantities of therapeutic feeds prescribed to their children. Comparing this variable across the camps, 83.1% ($n = 54$) and 44% ($n = 28$) of caregivers from Ifo and Hagadera refugee camps, respectively, stated that they could remember.

When asked if caregivers could correctly recall the prescribed quantities of therapeutic feed they were to give to their children, 11 (73.3%) of the caregivers in SC and 60 (89.6%) in OTP correctly recalled the prescribed quantities. Across the refugee camps, among the caregivers who stated that they could remember the quantities of therapeutic feed prescribed to their children, 48 (88.9%) and 23 (82.1%) from Ifo and Hagadera refugee camps, respectively, correctly recalled the quantities of therapeutic feeds prescribed (Figure 3.3).

The caregivers were also asked to recall the prescribed frequency of therapeutic feeds their children were receiving. Fifty two percent ($n = 23$) of caregivers in SC and 77.4% ($n = 65$) from OTP could remember accurately the prescribed frequencies of therapeutic feeds. Across the refugee camps, 85.9% ($n = 55$) of caregivers from Ifo and 46.9% ($n = 30$) from Hagadera could accurately remember the prescribed frequencies of therapeutic feeds (Figure 3.3).

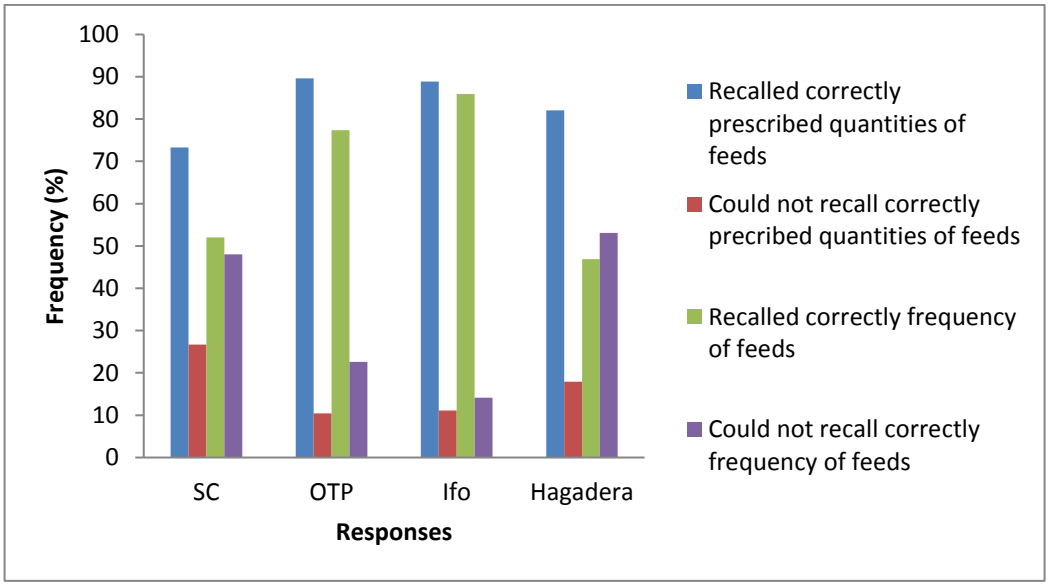


Figure 3:3 Caregivers' recalls on quantities and frequencies of prescribed therapeutic feeds

When caregivers were asked whether they gave their children any other feeds besides the therapeutic feeds prescribed, the results indicate that 22.7% ($n = 10$) of caregivers from SC and 69% ($n = 58$) of the caregivers from OTP had given their children other foods. Across the camps, 57.8% ($n = 37$) and 48.4% ($n = 31$) of caregivers from Ifo and Hagadera refugee camps, respectively, acknowledged giving their children other feeds beside the prescribed therapeutic feeds. Examples of common feeds given besides the therapeutic feeds were cow's milk (52%; $n = 36$), followed by porridge (14%; $n = 10$), anjela[2](13%; $n = 9$). Four percent ($n = 3$) of children were given a combination of these

[2] Anjela – Type of pancake made from wheat flour, milk and water with some sugar, common in Somali culture

foods such as porridge and anjela or milk and anjela (Figure 3.4).

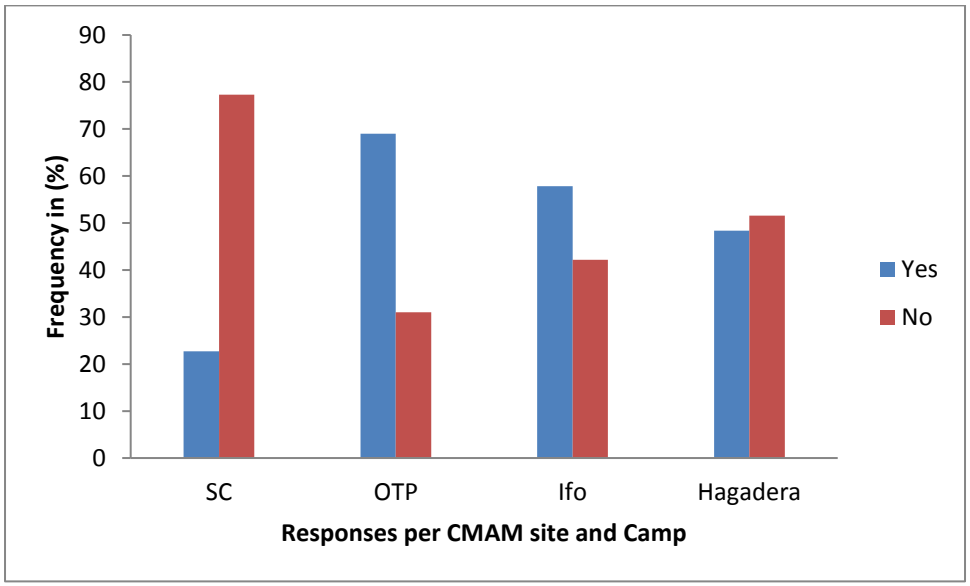


Figure 3:4 Responses on whether children were given other feeds apart from therapeutic feeds

Caregivers from OTP where questioned whether they had been given any routine medication[3] to administer to their children at home. Twenty three (27.4%) of the caregivers reported that they had been given medication (an antibiotic) to give to their children at home. Only seven of the 23 (34.1%) recalled the correct dosage of the antibiotics they were supposed to give. The correct dosage was verified from the children's medical records.

Lastly, caregivers were questioned why they were supposed to keep their children warm at night and during cold weather. In SC the majority (40.9%; $n = 18$) responded that it is because children are "thin and weak" while in OTP the majority (41.7%; $n = 35$) stated that the children "will die easily if exposed to cold". Across the camps, in Ifo, the majority of caregivers (43.1%; $n = 28$) stated that children "will die easily if exposed to cold", while in Hagadera the majority of caregivers (52.4%; $n = 33$) responded that it is because children are "unable to cover themselves".

[3] The routine medication question was asked only to the caregivers in OTP who are given antibiotics to administer to their children at home

A single score value was calculated from four key caregivers' knowledge assessment questions to determine a percentage mean score of caregivers' knowledge of medical and nutrition treatment objectives. These four questions included were: 1) If the caregiver knew the reason for the child's admission; 2) If the caregiver knew the prescribed quantities of therapeutic feeds; 3) If the caregiver gave the child any other feed besides prescribed therapeutic feeds; and 4) If the caregiver knew the reason for keeping children warm at night and during cold weather.

The caregivers in SC obtained a mean score[4] of 52.8% and the mean score of caregivers in OTP was 58%. However, there was no significant relationship between the caregivers' knowledge percentage score and the mean weight gain which was 3.85 g/kg/day in SC and 4.21 g/kg/day in OTP, nor the median length of stay which was 10 days in SC and 35 days in OTP.

3.4 DEFAULT RATES IN SC AND OTP

No child defaulted in SC or OTP during the entire study period.

3.5 LENGTH OF STAY OF SAM CASES IN SC AND OTP

The overall median length of stay of SAM cases in SC was 10 days while for SAM cases in OTP it was 35 days as indicated in the table 3.3 below.

[4] The percentage score was derived from four questions that were used to assess caregivers' knowledge of medical and nutrition objectives by adding the correct and positive responses, dividing by the total responses of 128 caregivers and multiplying by a hundred. 0–25% rated poor, 26%–50% rated fair, 51%–74% rated good, 75% and above rated excellent.

Table 3.3: Length of stay of SAM cases in SC and OTP

	Min	Max	Median
Length of stay in OTP (days)			
Ifo refugee camp	28	56	42
Hagadera refugee camp	14	77	35
Overall OTP length of stay	14	77	35
Length of stay in SC (days)			
Ifo refugee camp	3	19	10.5
Hagadera refugee camp	4	20	8.5
Overall SC length of stay	3	20	10

3.6 RELATIONSHIP BETWEEN ADMISSION MUAC AND LENGTH OF STAY IN SC AND OTP

Ninety five percent ($n = 82$) of SAM cases in OTP, had a lower admission MUAC of $\leq$ 11.4cm and a length of stay of less than 56 days, while the other 5% had an increased stay. Those with a higher admission MUAC of $\geq$ 11.5cm (two cases) had a length of stay of more than 56 days. The difference was not statistically significant.

In addition, just over 50% of SAM cases admitted in SC with a low MUAC of $\leq$ 11.4 cm ($n = 31$), had a length of stay of more than the recommended 10 days. Of those admitted with a higher MUAC of $\geq$ 11.5 cm ($n = 13$), 69.2% had a length of stay of less than 10 days. The difference was not statistically significant (Table 3.4).

Table 3.4: Relationship between admission MUAC and length of stay in SC and OTP

Chi-square tests for relationship between admission MUAC and length of stay (*n*=128)			
SAM cases with MUAC ≤ 11.4 cm – OTP (82 cases)	***N***	**%**	***p*-value**
MUAC ≤11.4 cm† with LOS* < 56 days	78	95.1	
MUAC ≤11.4 cm with LOS > 56 days	4	4.9	0.749
SAM cases with ≥ 11.5 cm – OTP (2 cases)			
MUAC ≥11.5 cm with LOS < 56 days	0	0	
MUAC ≥11.5 cm with LOS > 56 days	2	100	
SAM cases with MUAC ≤ 11.4 cm – SC (31 cases)			
MUAC ≤11.4 cm with LOS ≤10 days	15	48.4	
MUAC ≤11.4 cm with LOS ≥ 11 days	16	51.6	0.205
SAM cases with MUAC ≥ 11.5 cm –SC (13 cases)			
MUAC ≥11.5 cm with LOS ≤10 days	9	69.2	
MUAC ≥11.5 cm with LOS ≥ 7–10 days	4	30.8	

† In this study, MUAC ≤11.4 cm was considered as low MUAC while MUAC ≥11.5 cm as high MUAC for analysis

** LOS- length of stay*

3.7 AVERAGE WEIGHT GAIN

The overall average weight gain in SC was 4.21 g/kg/day while for OTP it was 3.85 g/kg/day as shown in the table 3.5.

Table 3.5: Average weight gain rate in SC and OTP

Average weight gain rate (n = 128)	
Average weight gain – OTP (n = 84)	3.85 g/kg/day
Average weight gain – SC (n = 39)*	4.21 g/kg/day

**The average weight gain for SAM children with medical complications for SC calculation did not include five children who had nutritional oedema*

3.8 CAREGIVERS' PERCEPTIONS OF QUALITY OF CARE IN CMAM PROGRAMMES

This section presents the findings on patient-centred communication in CMAM services. Patient-centred communication is one of the key components of patient-centred care. Due to the fact that effective communication is a critical component of patient-centred communication, this section first presents the findings on the level of communication between healthcare workers and caregivers. This is followed by a presentation of the findings of caregivers' perceptions of the quality of care, which included investigations into caregivers' perceptions of the healthcare process and staff attitudes during healthcare service delivery. Additional aspects of caregivers' feedback on quality of care are also presented.

3.7.1 Level of communication between healthcare workers and caregivers

Caregivers were asked whether healthcare workers had informed them of the nature of their child's illness on admission. Thirteen caregivers (29.5%) from SC and 59 (70.2%) from OTP indicated that they had been informed. In comparing this variable between the camps, 44 (68.8%) and 28 (43.8%) caregivers from Ifo and Hagadera refugee camps, respectively, acknowledged that they had been informed by healthcare workers of the nature of their children's illness (Figure 3.5).

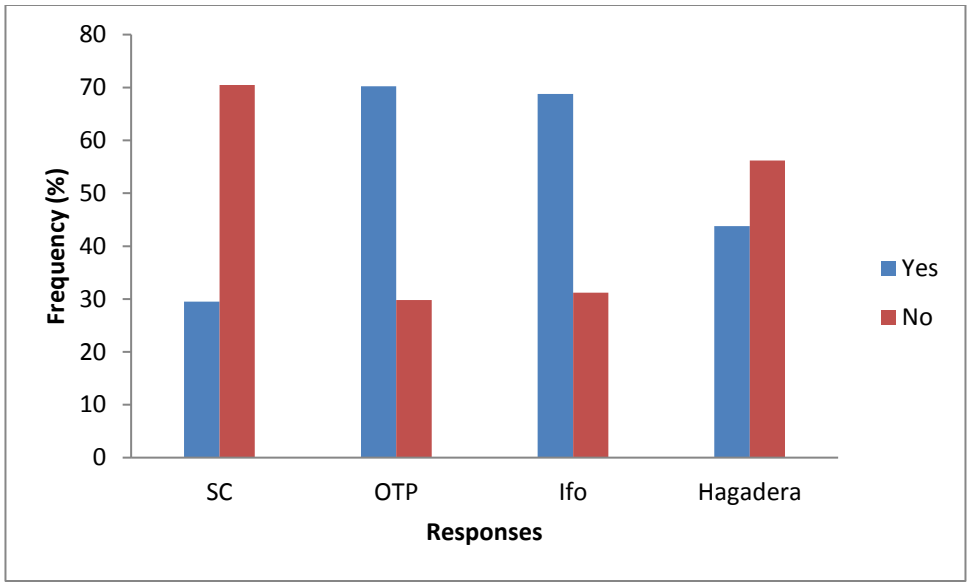


Figure 3:5 Caregiver's responses on whether health care workers told them nature of their child's illness on admission

The researcher asked caregivers whether healthcare workers had communicated to them regarding the duration of stay of their children whilst receiving treatment. In the SC, 4.5% ($n = 2$) of the caregivers and 34.5% ($n = 29$) of the caregivers from OTP responded that health workers had informed them of the expected duration their children would be required to remain on the CMAM programme. In the two camps, 46.9% ($n = 30$) and 1.6% ($n = 1$) of the caregivers from Ifo and Hagadera refugee camps, respectively, indicated that healthcare workers had explained to them the duration their children were expected to receive treatment (Figure 3.6).

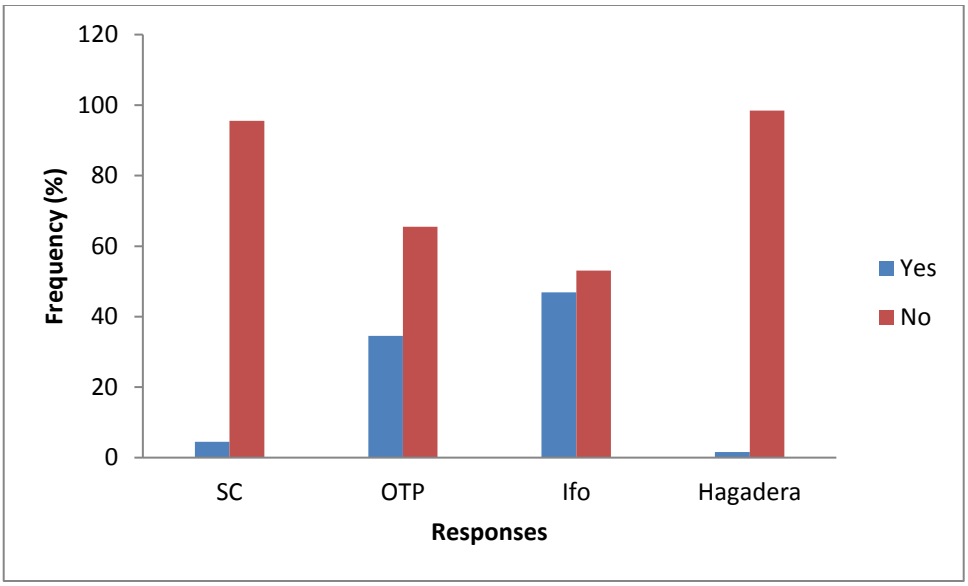


Figure 3:6 Caregivers' reposnes on whether healthcare workers informed them duration of stay of their children whilst receiving treatment

In the SC 15.9% ($n = 7$) of caregivers and 6% ($n = 5$) of caregivers in OTP indicated that they had been informed of the target weight their children would be required to attain in order to be discharged. Across the refugee camps, 10.9% ($n = 7$) and 7.8% ($n = 5$) of caregivers from Ifo and Hagadera, respectively, were informed of the target weight their children would be required to attain to be discharged as indicated (Figure 3.7). In terms of MUAC as discharge criteria, none of the caregivers from SC and 9.5% ($n = 8$) in OTP had been informed by the healthcare workers of the exit MUAC measurements their children were required to have attained in order to be discharged. All eight caregivers who were informed of the exit MUAC required for discharge were from Ifo refugee camp.

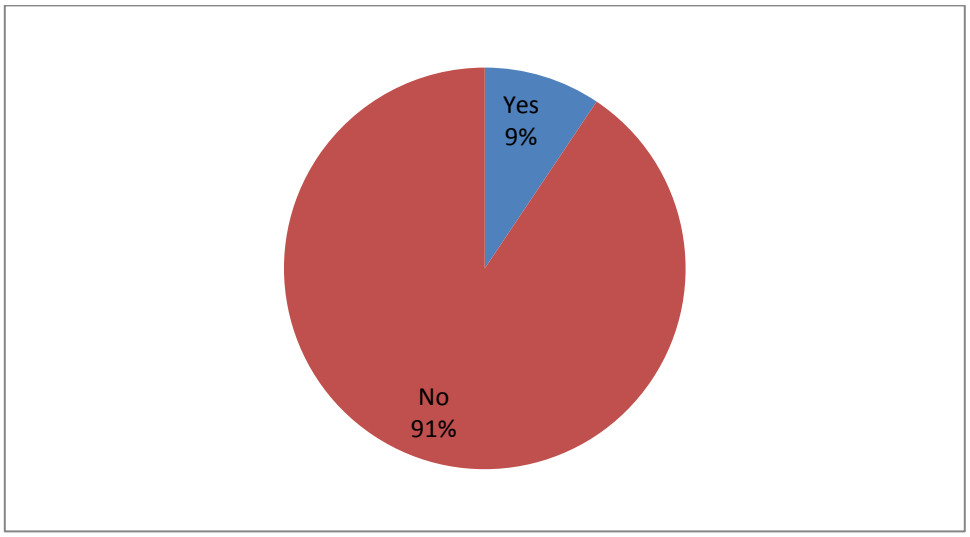


Figure 3:7 Caregivers' responses on whether they were informed by healthcare workers about their children target weight

Sixty-six percent ($n = 29$) of caregivers from SC and 73.8% ($n = 62$) from OTP responded that they had been given information by healthcare workers on the therapeutic feeds they were supposed to give to their children. Across the refugee camps, 84.4% ($n = 54$) and 57.8% ($n = 37$) of caregivers from Ifo and Hagadera, Refugee Camps respectively, reported having been given information with regard to the therapeutic feeds (Figure 3.8).

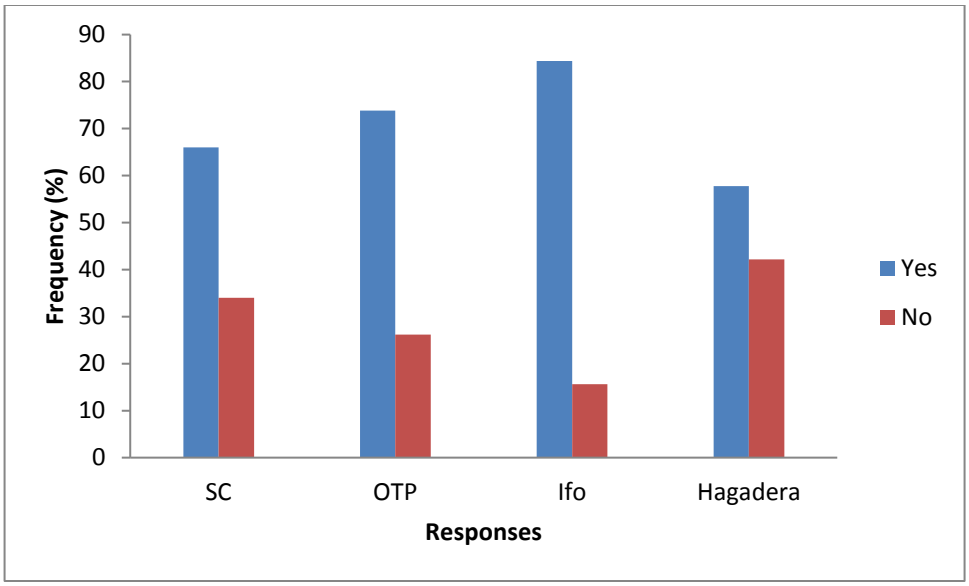


Figure 3:8 Caregivers' response on whether healthcare workers gave them information on therapeutic feeds to give to their children

When asked what information the caregivers were given by healthcare workers concerning therapeutic feeds, various reponses were collected and categorised for SC and OTP sites from the two refugee camps. More than three-quarters of the caregivers from SC and OTP, ($n = 34$ and $n = 50$, respectively) reported that they had been informed they would be given 'milk' and less than 5% ($n = 2$ and $n = 3$) in both SC and OTP, respectively) were informed they would receive both milk and Plumpy Nut[5]. However, only 16.1% ($n = 11$) and 3.2% ($n = 2$) from SC and OTP, respectively, indicated that the therapeutic feeds would "improve the health of my child" or "help my child grow".

3.7.2 Caregivers' perceptions of quality of care provided

This section reports the findings of seven components used to assess caregivers perceptions of the quality of care in CMAM services.

When caregivers were requested to rate how they and their children had been received by healthcare workers on the first day, 52.3% ($n = 23$) of caregivers from SC rated it as

[5] Plumpy nut- Ready to use therapeutic feed used for treatment of acute severe malnutritition in OTP

'good' while 22.7% ($n = 10$) rated it as 'very good'. In OTP, 54.3% ($n = 46$) of the caregivers rated it 'good' while 22.6% ($n = 19$) rated it 'fair'. Across the camps, in Ifo, 67.2% ($n = 43$) of caregivers responded that it was 'good' while 15.6% ($n = 10$) rated it 'very good'. In Hagadera refugee camp, 53.1% ($n = 34$) of caregivers responded that it was 'good' while 26.7% ($n = 17$) rated it as 'fair' as indicated (Figure 3.9).

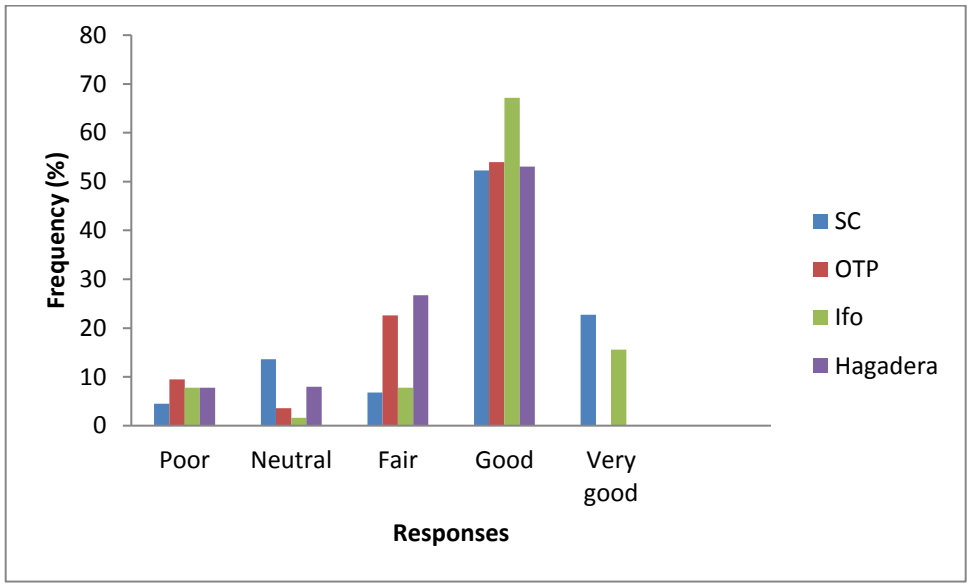


Figure 3:9 Caregivers' rating of their first day of reception by healthcare workers when seeking CMAM services

On probing further on what may have motivated caregivers to give a particular rating regarding the first day's reception, various responses were obtained. Across the camps, in Ifo, 60.9% ($n = 39$) of caregivers responded that healthcare workers 'were welcoming', while 9.4% ($n = 6$) said the 'environment wasn't friendly'. Almost a quarter ($n = 13$) of caregivers in Hagadera refugee camp indicated that they had not been welcomed while 23.4% ($n = 15$) responded that they 'were attended well' as indicated (Figure 3.10).

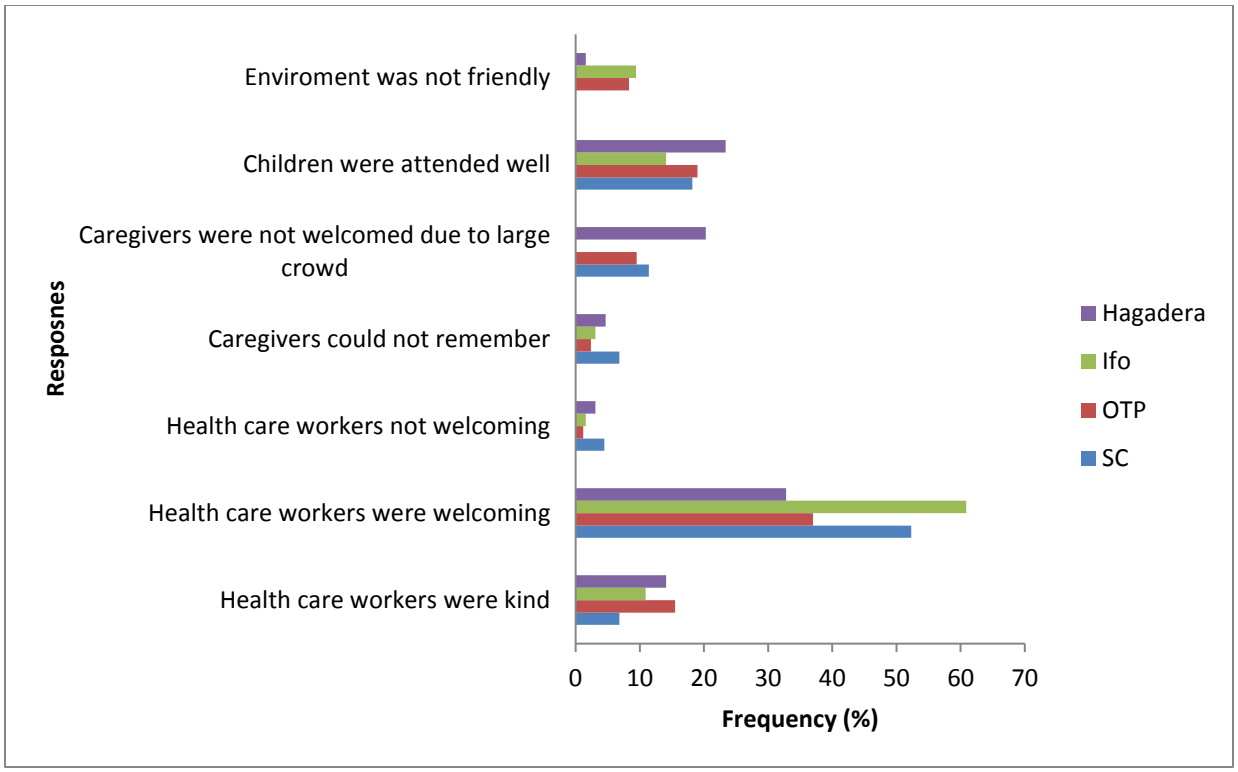


Figure 3:10 Caregivers' reasons on what motivated them to rate their first day reception by health care workers the way rated it

The researcher requested caregivers to rate the response of healthcare workers to their requests around the treatment their children were receiving. In SC, 40.9% ($n = 18$) of caregivers rated healthcare workers responses to their requests regarding their children's treatment as 'good' and 9.1% ($n = 4$) rated it as 'very poor'. At the OTP, 54.8% ($n = 46$) of caregivers rated it as 'good', whereas 3.6% ($n = 3$) rated it as 'very poor'. Caregivers' rating of healthcare workers' response to their requests concerning their children's treatment between the two camps indicated that 68.8% ($n = 44$) of caregivers rated it as 'good' while in Hagadera refugee camp, 34.4% ($n = 22$) of the caregivers rated it as 'fair' as indicated (figure 3.11).

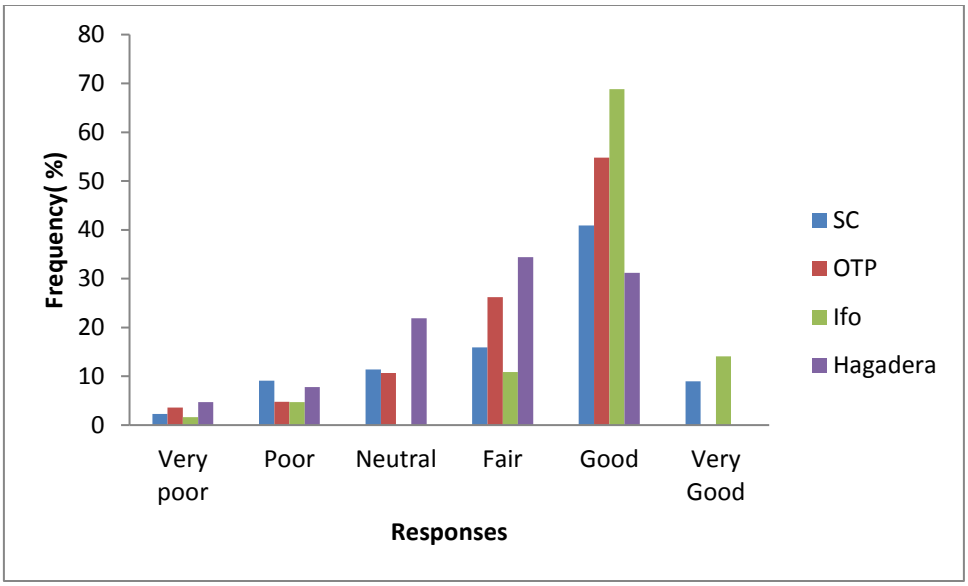


Figure 3:11 Caregivers' rating of healthcare workers' responses to their requests around their children treatment

The researcher investigated the reasons that motivated caregivers to rate how the healthcare workers had responded to their requests (Figure 3.12). In Ifo refugee camp, 23.4% ($n = 15$) of caregivers responded that health workers had been welcoming, while almost a third ($n = 18$) responded that health workers were not time-conscious. In Hagadera refugee camp 20.3% ($n = 13$) of caregivers responded that health workers had been welcoming, while 17% ($n = 11$) stated that there were not enough staff.

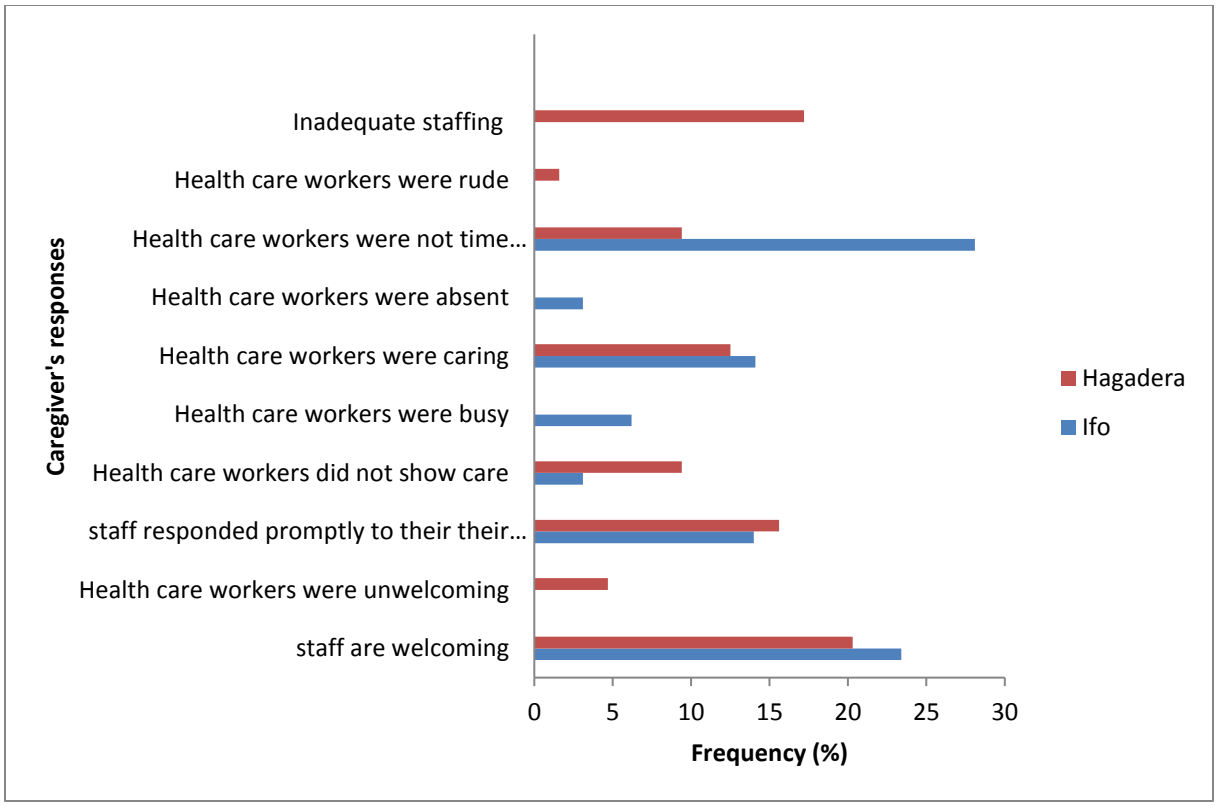


Figure 3:12 Reasons for caregivers' rating of how healthcare workers' responded to their requests around their children treatment

When comparing responses in SC and OTP on their perceptions of whether healthcare workers had time for them and their children, 75% ($n = 33$) of caregivers in SC and 89.3% ($n = 75$) of caregivers in OTP gave a positive response. Across the camps, 89.2% ($n = 58$) of caregivers in the Ifo refugee camp and 79.4% ($n = 50$) in Hagadera refugee camp responded that healthcare workers had given them and their children sufficient time and attention as indicated (Figure 3.13).

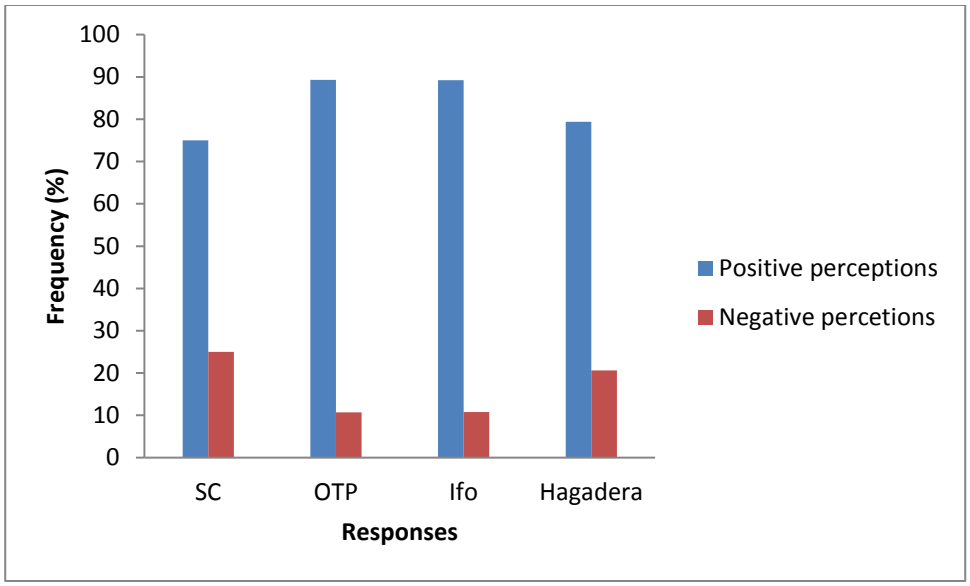


Figure 3:13 Caregivers' perceptions on whether health care workers gave them and their children sufficient time and attention

The study investigated caregivers' perceptions of whether healthcare workers had adequate skills. At SC, 90.9% ($n = 40$) of caregivers responded that healthcare workers have adequate skills, compared with a much lower response (59.5%; $n = 50$) of caregivers at OTP. When comparing the two camps, 67.2% ($n = 43$) at Ifo and 73.4% ($n = 47$) Hagadera responded that the caregivers felt healthcare workers had adequate skills. Figure 3.14

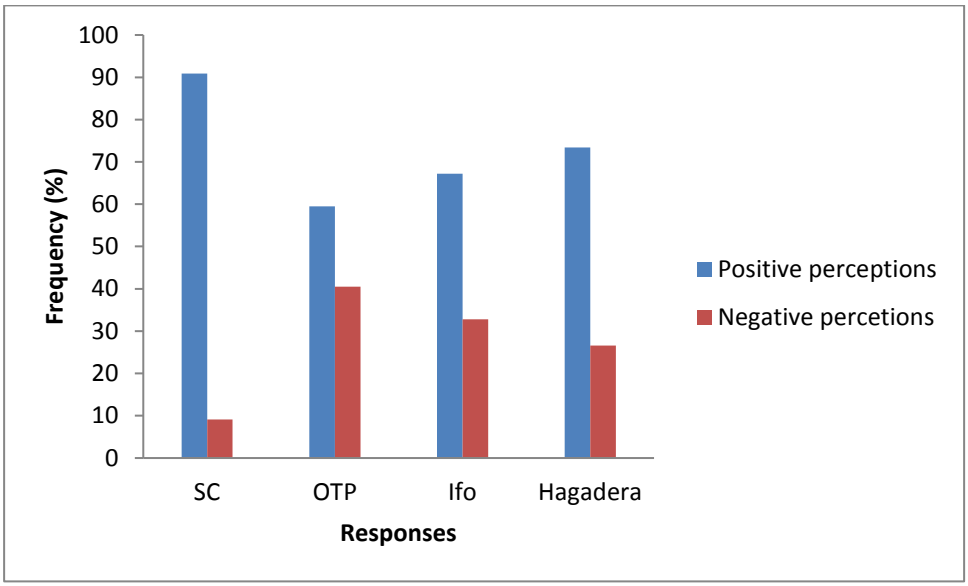


Figure 3:14 Caregivers' perception whether healthcare workers had adequate skills

In assessing the caregivers' perceptions of whether they felt their children were receiving satisfactory healthcare services, 63.6% ($n = 28$) in SC and 72.6% ($n = 61$) in OTP acknowledged that they were satisfied with the healthcare services their children had received. Across the refugee camps, 67.2% ($n = 43$) of caregivers at Ifo and 71.9% ($n = 46$) from Hagadera acknowledged that they were getting satisfactory healthcare services. Figure 3.15

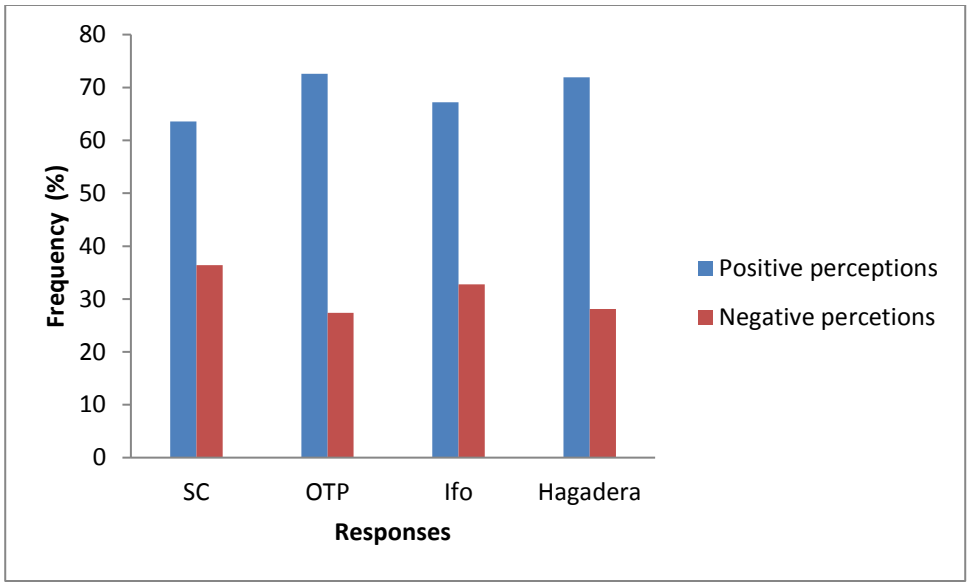


Figure 3:15 Caregivers' perceptions on whether they felt their children were receiving satisfactory healthcare services

When caregivers were asked about their perceptions of whether the programme had enough staff available, 56.8% ($n = 25$) from SC and 48.8% ($n = 41$) from OTP responded that there was enough staff. Across the camps, 73.4% ($n = 47$) of caregivers from Ifo and 29.7% ($n = 19$) from Hagadera indicated that there were enough staff members.

The researcher requested caregivers to rate the CMAM services where their children were receiving treatment. In SC, over two-thirds of caregivers ($n = 30$) rated the CMAM services as either 'good' or 'very good'. Similarly, just under two thirds ($n = 55$) of caregivers in OTP rated the services as 'good' or 'very good'. Both in SC and in OTP, only one caregiver in each care level rated the CMAM services as 'poor'. The response of 'very poor' was given by one caregiver (2.3%) in SC (Figure 3.16).

Rating of the CMAM services at Ifo refugee camp indicated that 1.6% ($n = 1$) of caregivers rated them as 'very poor', 6.2% ($n = 4$) were neutral, 12.5% ($n = 8$) rated CMAM services as 'fair', whilst 60.9% ($n = 39$) responded that they were 'good' and 18.8% ($n = 12$) stated that they were 'very good'. In Hagadera refugee camp, 3.1% ($n = 2$) of caregivers rated CMAM services as 'poor', 10.9% ($n = 7$) were neutral, 32.8% ($n =$

21) stated that they were 'fair', 51.6 % ($n = 33$) rated them as 'good' and 1.6% ($n = 1$) rated CMAM services as 'very good' as indicated (Figure 3.16).

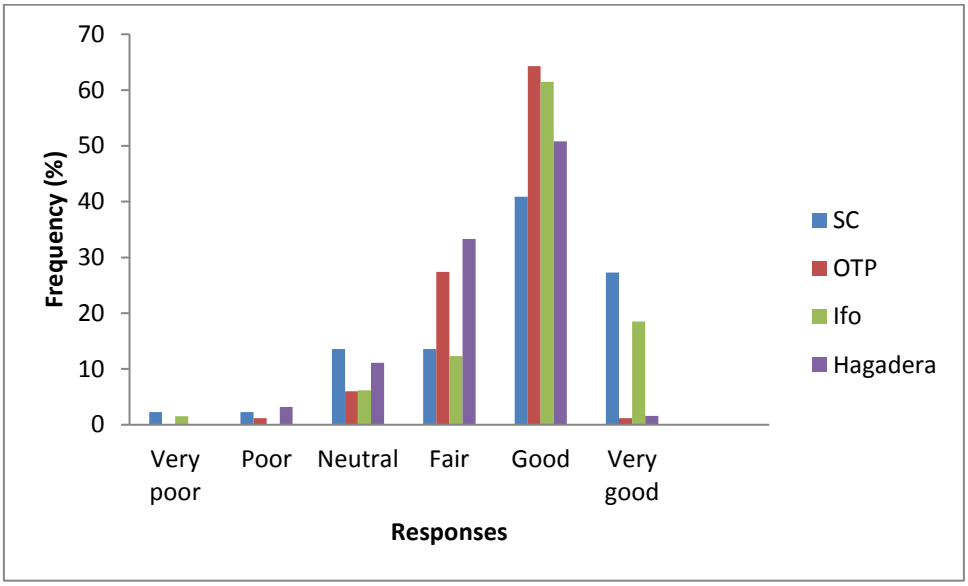


Figure 3:16 Caregivers'rating of health services

When asked what motivated caregivers to provide their rating on healthcare services they accessed, slightly more than a third ($n = 17$) of the caregivers in SC stated that services were good, while close to a half ($n = 40$) in OTP stated that their children were improving. Only two of the caregivers in SC responded that healthcare workers were rude. An equal number of caregivers ($n = 4$) in both SC and OTP responded that there were not enough staff. Across the camps, in Ifo, more than a third of caregivers stated that their children were improving, while in Hagadera, one caregiver responded that staff were rude and 15.9% ($n = 10$) of caregivers responded that staff were insufficient and had inadequate skills (Figure 3.17).

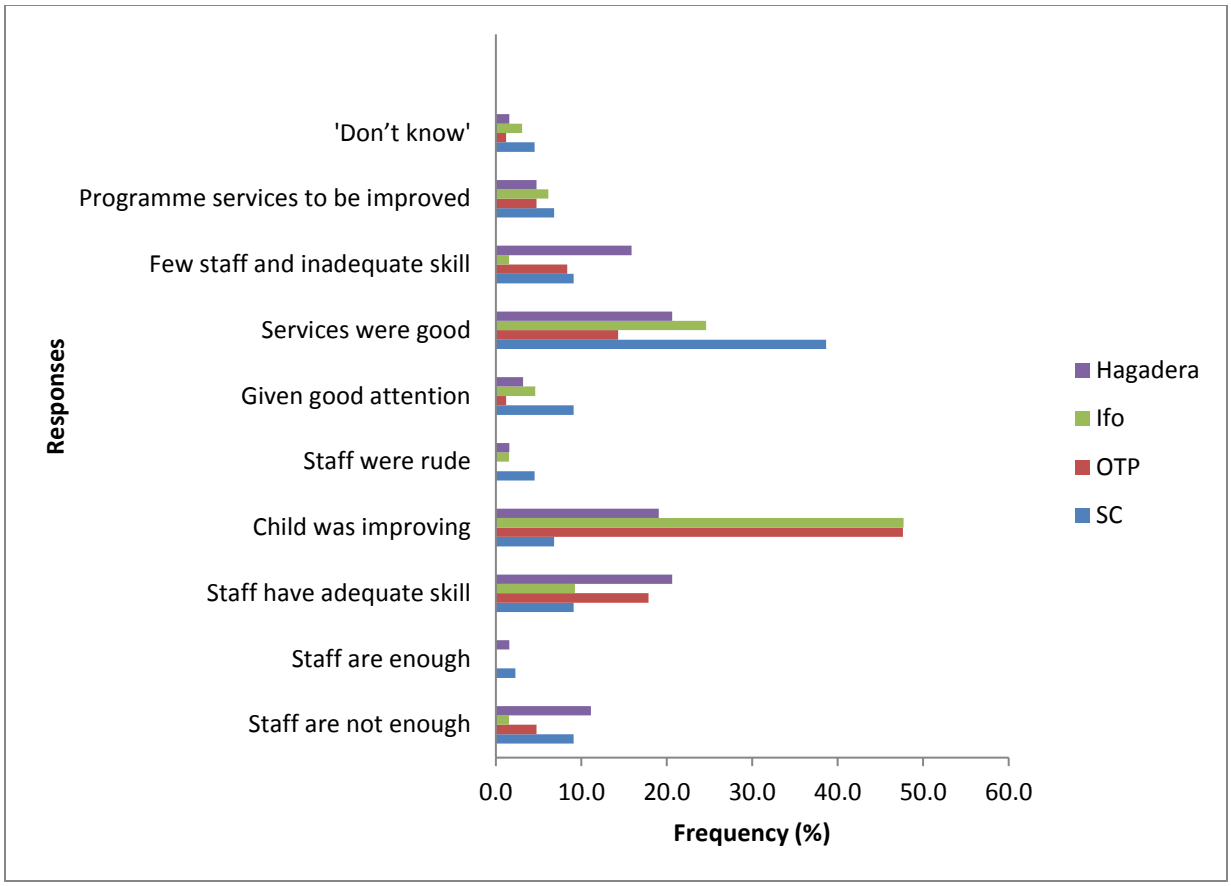


Figure 3:17 Caregivers' reponses on what motivated them to rate the way they rated health services

3.7.3 Additional caregivers' feedback on aspects of quality of care

This section presents findings for an additional four components used to capture caregivers' feedback on other aspects of quality of care in CMAM services.

Upon initial admission for treatment at CMAM services sites, 98.8% ($n = 83$) of caregivers in OTP and 15.9% ($n = 7$) in SC reported that healthcare workers had introduced themselves to them. In Ifo refugee camp, 71.9% ($n = 46$) of caregivers and in Hagadera, 68.8% ($n = 44$) of caregivers indicated that healthcare workers had introduced themselves.

The study assessed the extent of communication of treatment objectives by healthcare workers, free sharing of information pertaining to the child's progress and the level of

involvement of caregivers in decision-making concerning their children's treatment. Twenty-five percent (n =11) of caregivers in SC responded that they had been given updates by healthcare workers on their children's progress since being admitted. This response across the camps indicated that only 3.2% (n = 2) of caregivers in Hagadera and 13.8% (n = 9) in Ifo had been given such updates. In OTP, 76.2% (n = 64) of caregivers reported that healthcare workers had updated them on their children's health progress during previous visits. Across the camps, 58.5% (n = 38) of caregivers in Ifo and 41.3% (n = 26) from Hagadera refugee camps reported that they had been given updates.Figure 3.18

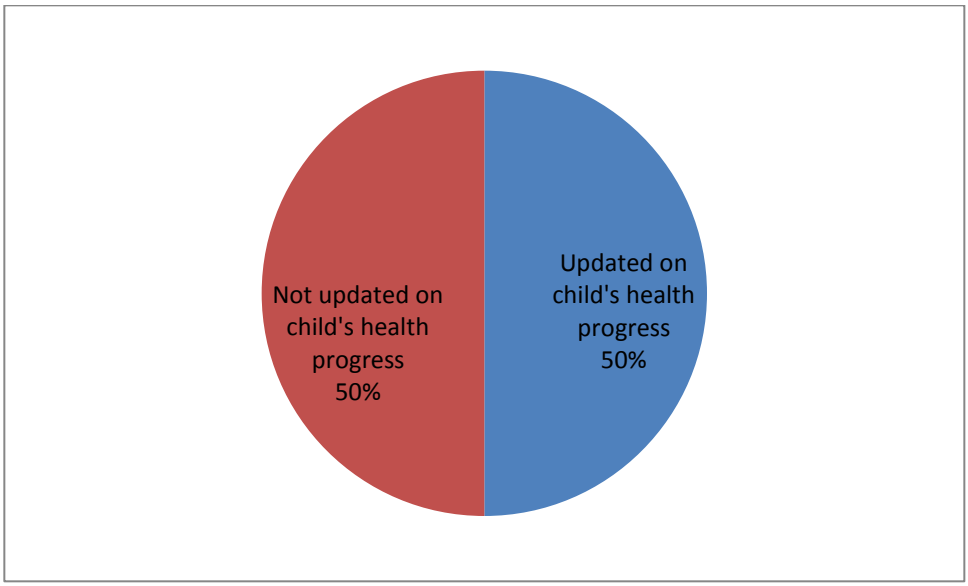


Figure 3:18 Caregivers' reponses on whether they received updates on their children health progress from healthcare workers

When caregivers were questioned whether they had an opportunity to ask healthcare workers questions related to their children's treatment process, 54.5% (n = 24) of caregivers in SC and 63.1% (n = 53) in OTP responded in the affirmative. Across the camps, 50 (78.1%) and 27 (42.2%) of the caregivers from Ifo and Hagadera refugee camps, respectively, reported to have had the opportunity to ask health workers about their children's treatment process. The most frequently asked question in Ifo refugee camp related to medication, while in Hagadera it was on the child's health progress (Figure 3.19).

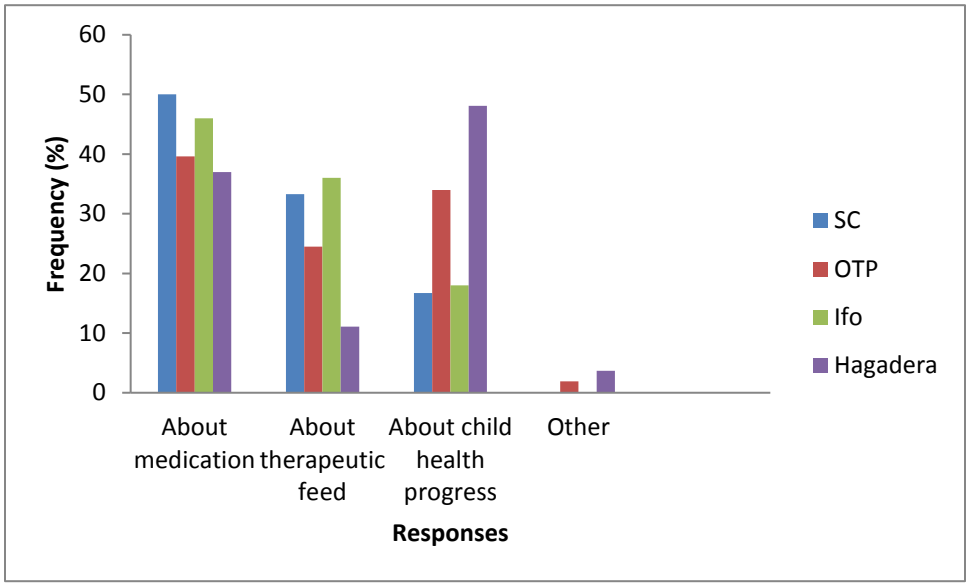


Figure 3:19 Examples of questions caregivers asked healthcare workers concerning their children treatment

With respect to caregivers' participation in decision-making in their children's treatment progress, 9.1% ($n = 4$) of caregivers in SC and 42.9% ($n = 36$) in OTP stated that the healthcare workers involved them in making decisions pertaining to their children's treatment. Across the two refugee camps, 38.5% ($n = 25$) of caregivers from Ifo and 23.8% ($n = 15$) from Hagadera refugee camps responded that they had been involved in decision-making regarding their children treatment process.

A further probe on the extent of caregivers' involvement in decision-making for their children's treatment indicated that 6.8% ($n = 3$) of the caregivers in SC and 15.5% ($n = 13$) in OTP had had an opportunity to discuss the treatment goals of their children with healthcare workers with respect to target weight or exit MUAC measurements. Comparing the response between the two camps, only 21.9% ($n = 14$) of caregivers in Ifo and 3.1% ($n = 2$) of caregivers in Hagadera had the opportunity to discuss treatment goals with healthcare workers. Figure 3.20

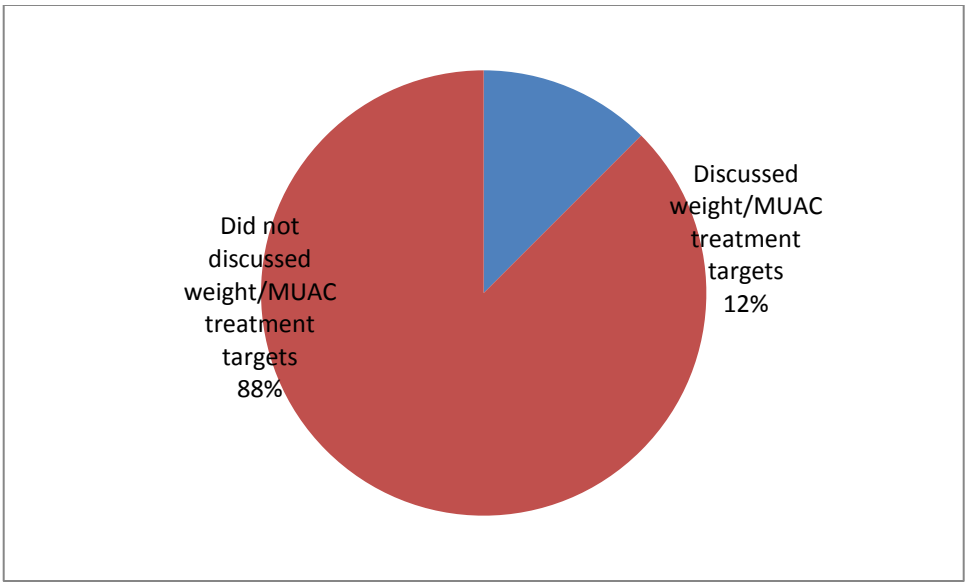


Figure 3:20 Caregivers' responses on opportunity to discuss treatment goals with healthcare workers

In caregivers' perception of quality of care questionnaire, twelve questions which related to perceptions or attitude were selcted to determine a percentage score to give an overall view of caregivers' perceptions of the quality of care in CMAM services. The rest of questions were on caregiver's knowledge assessment and were not included to calculate caregiver's perception.In SC, the mean score of caregivers' perceptions of the quality of care was 66.3%, while in OTP the mean score was 70%. There was, therefore, no significant relationship between the mean score of caregivers' perceptions of the quality of care and the mean weight gain which was 3.85 g/kg/day in SC and 4.21 g/kg/day in OTP, nor with the median length of stay which was 10 days in SC and 35 days in OTP.

CHAPTER 4: DISCUSSION

4.1 INTRODUCTION

Despite their recent introduction, CMAM programmes are still showing relatively poor outcomes in the treatment of SAM cases, such as high default rates, low recovery rates and low coverage rates.[2,3] The CMAM model, as opposed to TFCs, requires significant involvement of caregivers in the delivery of the treatment to children without medical complications at home. Examples of the caregivers' involvement are: administering ready-to-use therapeutic foods, administering certain routine medications as prescribed, as well as complying with the scheduled weekly follow-up at the OTP.[2]

Several factors may influence caregivers' involvement in the treatment process. This study investigated how caregivers' knowledge and CMAM service delivery may influence their participation in the treatment process and how these may affect default rates. The discussion in this section has been presented according to the study objectives.

4.1.1 Study participants' demographic characteristics

This was a cohort study which recruited a total of 128 children from the ages of 6–59 months and their caregivers from both Ifo and Hagadera refugee camps in Kenya. From the total group of children recruited, 84 were diagnosed with SAM without medical complications and 44 were diagnosed with SAM with medical complications. Most of the children recruited in this study were from the younger age group of 6–23 months and almost two thirds of the SAM cases were female. These findings were consistent with other previous studies that found that most of the children with acute malnutrition belong to the younger age group of 6–23 months and are female.[30,31] Children were mostly accompanied by females (primarily the mother of the child), who accounted for 95.5% ($n = 42$) and 97.6% ($n = 82$) in SC and OTP treatment sites, respectively. Caregivers' age in both SC and OTP was between 20 and 30 years. This was consistent with a

cohort study conducted in northern Ethiopia with a non-refugee population which found the age of caregivers to be under 30 years.[32] The findings of this study suggested that females were largely responsible for the care of the malnourished children and that most SAM cases were from young refugee families.

At 56.8%, more caregivers had primary school education in SC than those in OTP, at 26.2%. Tests for the relationship between caregivers' education and length of stay using Pearson's chi-square test did not show any significant relationship in either SC or OTP. Caregiver's education level may affect their knowledge and understanding on their children's treatment objectives which would likely affect their compliance to treatment. Non-compliance to treatment may cause SAM children to have relatively longer lengths of stay or defaults rates. In this study it is not clear why there was lack of relationship between these variables.

However, one study in a clinical setting with a paediatric population, investigating the role of caregiver literacy in glycaemic control in paediatric type I diabetes, found that caregivers' literacy levels played a significant role in glycaemic control in paediatric type I diabetes.[33] These findings suggest that caregivers, especially those in OTP who are entrusted with continuity of treatment at home for their children by administering routine medication and therapeutic feeds, may require a simple literacy assessment by health workers to identify any problems and assist them appropriately.

4.1.2 Nutrition status on admission

The study participants in SC were admitted with an average MUAC of 10.8 cm (±1.2 cm), while those in OTP had an average MUAC of 11.1 cm (±0.5 cm). The use of MUAC as an independent admission criterion in this study confirms one of the successes realised in the initiation of the CMAM model which simplified admission.[34] Only children in SC had nutritional oedema, which was grade two (++). This was in consistent with Kenya's national guidelines for integrated management of acute malnutrition that provides that all children with grade ++ oedema should be managed in SC.[4] This study found a greater caseload of marasmus, both with and without medical

compli”cations. This is consistent with the findings in a study conducted in El Geneina internally displaced population camp (IPDS) in West Darfur State, Sudan.[35]

4.2 CAREGIVERS' KNOWLEDGE OF TREATMENT OBJECTIVES IN CMAM PROGRAMMES

In this study, caregivers' knowledge of medical and nutrition treatment objectives was assessed using five components as discussed below:-

i) Most of the caregivers knew the reason why their children had been admitted to a CMAM programme. All the caregivers from Ifo refugee camp stated that their children had been admitted due to malnutrition, compared to 61.7% from Hagadera refugee camp. A previous nutrition programme coverage survey conducted in Dadaab Refugee on community knowledge of presence of CMAM services reported that 83% and 50% of community members from Hagadera and Ifo refugee camps, respectively, knew existence of CMAM services[20] This study reports some differences within the camps where caregivers from Ifo refugee camp were better informed about their children's condition than those from Hagadera refugee camp. This is in contrast to previous nutrition coverage survey findings. A possible explanation for the observed differences may be a improved community mobilization strategy in Ifo refugee camp, which may have led to more community members being able to recognise malnutrition. It may also be attributed to health workers sharing information with caregivers more readily in this refugee camp when their children's were admitted.

ii) This study found that slightly more than a half of the caregivers, 50.8% (*n*=33) and 55.6% (n=36), from Ifo and Hagadera refugee camps, respectively, did not know how long it would take their children to complete treatment. The majority of those who stated that they knew the duration gave varying and incorrect responses that indicated a lack of knowledge of the required duration of treatment. These findings were consistent with another study conducted in south Sudan, Myanmar, Darfur, Ivory Coast and Ethiopia which reported poor caretakers' understanding of the treatment duration their children would take in CMAM programs.[14] These findings

suggest that there is a need for health workers to provide detailed information to caregivers on treatment duration, especially for those whose children are treated in OTP and are required to make weekly visits.

iii) An assessment of caregivers' knowledge on therapeutic feeds indicated that 88.9% ($n = 57$) and 82.1% ($n = 53$) of caregivers from Ifo and Hagadera refugee camps, respectively, knew the correct quantities of therapeutic feeds to give their children. Eighty-six percent ($n = 55$) of caregivers from Ifo refugee camp and 46.9% ($n = 30$) from Hagadera Refugee accurately recalled the prescribed frequencies of therapeutic feeds. This indicates that less half the total number of caregivers from Hagadera refugee camp gave their children therapeutic feeds at the recommended frequencies. Only 14% ($n = 9$) of caregivers from Ifo refugee camp did not give the therapeutic feeds at the correct frequency. This further suggests the possibility of under- or over-dosage of therapeutic feeds given to SAM cases. Providing the correct quantities and frequencies of prescribed therapeutic feeds contributes significantly to SAM recovery rates. Inadequate intake of therapeutic feeds has been cited as one of the secondary causes of failure for SAM cases to recover.[10]

iv) This study found that there were more caregivers in OTP than in SC (69%; $n = 42$ and 22.7%; $n = 10$, respectively), who gave their children other feeds besides the prescribed therapeutic feeds. There was no significant difference across camps. These findings suggest either caregivers' lack of knowledge of the importance of providing only the prescribed feeds for optimal recovery, or poor adherence to the treatment. It is also possible that OTP caregivers had an opportunity to access other feeds at home as opposed to those who were restricted in SC during the treatment period. Existing guidelines on acute malnutrition indicate that children with acute malnutrition during treatment should only take the prescribed therapeutic feeds for their optimal recovery.[3,10] No other available studies were found on this finding.

An assessment of caregivers' knowledge of routine medication administration at home indicated that only a small proportion of caregivers (27.4%) had been giving routine medication (an antibiotic) at home. Of these, only seven (30.1%) recalled the correct dosage of the antibiotic they administered to their children at home. These findings reveal inadequate caregivers' knowledge of antibiotic dosage. They further indicate that only a small proportion of caregivers in OTP reported having been given routine medication to administer at home. Routine medication should be prescribed to all SAM cases on admission.[3,10] A cohort study in Tigray, northern Ethiopia conducted in OTP, found that administration of routine medications was done partially, which negatively affected recovery.[36] These study findings suggest the possibility of poor antibiotics adherence among SAM cases at home. as and missed opportunities for some SAM cases to receive routine medication.

v) Hypothermia is one of the most common causes of death in children with acute malnutrition.[37] This study assessed whether caregivers knew the reason for keeping their children warm during cold weather and at night. From both refugee camps, less than half (43.1% and 33.3% from Ifo and Hagadera refugee camps, respectively) could give the appropriate reason why their children were supposed to be kept warm. No related studies were found on this finding. These findings indicate the need for healthcare workers to place greater emphasis on caregivers keeping their malnourished children warm to prevent hypothermia.

The five components discussed above were used to provide an overall estimate of caregivers' knowledge of nutrition and medical objectives in both SC and OTP using a percentage mean score. However, no such previous studies were found to form the basis of such estimations. The mean score[6] of caregivers in SC was 52.8%, while for OTP it was 58%. These percentage mean scores of knowledge for both SC and OTP

[6] Percentage score was derived from four questions that were used to assess caregivers' knowledge of medical and nutrition objectives by adding the correct and positive responses and dividing by total responses of 128 caregivers, and then multiplying by a hundred. 0-25%- rated poor, 26%-50%-rated fair, 51%-74%-rated good, 75% and above-rated excellent

were rated as good. The findings of this study indicated that, overall, caregivers had 'good' knowledge of nutrition and medical objectives.

There are no known findings on caregivers' knowledge on treatment objectives in severe acute malnutrition in Dadaab Refugee Camp or in other refugee populations. However, a previous coverage survey conducted in Dadaab Refugee Camp assessed community's knowledge on the presence of acute malnutrition program.[20]

4.3 DEFAULT RATES

According to the minimum standards set by the *Sphere Project*, a default rate of <15% is considered acceptable.[9] In this study, the default rate was zero. Previous monitoring records indicated low default rates of <15% in these two refugee camps. This was consistent with other studies on default rates with refugee populations in Chad from two refugee camps, Mile and Kounoungou, which reported low defaults of 4.8% and 7.0%, respectively.[37] There are several other studies on non-refugee populations reporting low default rates.[37,38] A recent study carried out in Kenya in OTP reported a low default rate of 2.9%.[38] A retrospective study conducted in Burkina Faso by Médecins Sans Frontières (MSF) reported a default rate of 7.9%.[38] A similar study conducted in Tigray, northern Ethiopia reported a default rate of 13.9%.[36] These studies had default rates within the recommended range. However, there are other studies reporting relatively higher default rates of 17.5%, 22.7% and as high as 80.2%.[31,32,39] The zero default rate reported in this study may be attributed partly to a relatively shorter length of stay in OTP (median length of stay 35 days), good caregivers' knowledge of treatment objectives and relatively high positive perceptions by caregivers of the quality of care of CMAM services reported in this study.

4.4 LENGTH OF STAY, MUAC AND AVERAGE WEIGHT GAIN

4.4.1 Length of stay for SAM children in SC and OTP

The study findings indicate a median length of stay of SAM cases without medical complications of 35 days. No studies were found on length of stay which involved

refugee populations. However, two different studies in OTP in northern and south-western Ethiopia reported a mean length of stay of about 45 days and 50 days, respectively.[36,39] A study conducted in Yemen in an OTP reported a length of stay of SAM cases of 40 days.

The findings of this study reported a length of stay of SAM cases with medical complications of 10 days. A similar study done in Bukavu, Republic of Congo reported a median length of stay of 19 days[40] while another study in north India reported an average length of stay of 11.7 days (± 7.59 days).[41] A study in Lusaka, Zambia that involved SAM cases with medical complications in in-patient care, reported a median length of stay of 10 days.[18]

The recommended length of stay for SAM cases with medical complications is 7–10 days, while for SAM cases without medical complications it is 56 days.[9] SAM cases with medical complications receiving treatment in SC are referred to OTP for nutrition support after being stabilised. This study reported a relatively shorter length of stay in OTP. However, the length of stay for SC was within the recommended range of 7–10 days. Relatively longer lengths of stay may be associated with non-compliance to the treatment protocol, such as frequent absenteeism or underlying medical complications. On the other hand, discharging SAM cases too early (shorter length of stay) is likely to lead to relapse cases. It is therefore recommended that SAM cases that meet discharge criteria before the minimum period of 56 days (8 weeks) in OTP, should be retained on the programme until 56 days before being discharged.[10] Therefore, the relatively shorter length of stay reported in this study for OTP may be attributed to discharging of SAM cases before the recommended minimum period of 56 days.

4.4.2 **Relationship between length of stay and MAUC gain**

This study also found that there was no significant difference in length of stay between SAM cases admitted with a lower MUAC of 11.4 cm and those admitted with a MUAC ≥11.5cm. This is inconsistent with a study conducted in OTP with a non-refugee population at Lilongwe, Malawi, which found that SAM cases admitted with a lower

MUAC of ≤11.5cm had longer lengths of stay.[42] A possible explanation for these differences is that SAM cases admitted with either a lower or higher MUAC met discharge criteria within the same treatment durations. However, the difference observed in these findings could also be attributed to the differences in study settings, where the study in Malawi was done in rural settings, compared to this study which was conducted in emergency settings.

4.4.3 Average weight gain

This study found the average weight gain rate in SC and OTP to be 3.85 g/kg/day and 4.21 g/kg/day, respectively. An average weight gain rate of < 5 g/kg/day is considered poor.[38] This finding was consistent with a similar study carried out in OTP in a non-refugee population in Nairobi, Kenya, which reported an average weight gain of 3.7 g/kg/day.[36] However, it was inconsistent with studies conducted in Burkina Faso, western Ethiopia and northern Ethiopia which reported an higher average weight gain of 5.4g/kg/day, 5.76g/kg/day and 6.30g/kg/day, respectively. [5,9,32] The possible explanation for poor average weight gain reported in this study may be partly due to relatively shorter lengths of stay for SAM cases in OTP. Inaccurate knowledge in frequencies of therapeutic feeds by caregivers may be also a contributing factor in both SC and OTP. Another possible explanation is that the possibility of poor antibiotic administration by caregivers may delay recovery from infections and hence poor gain of weight.

4.5 CAREGIVERS' PERCEPTIONS OF QUALITY OF CARE IN CMAM PROGRAMMES

This is a preliminary study on a component of patient-centred care in a CMAM programme within an emergency context. Several studies in non-refugee populations indicate that patient-centred care contributes to improved patient satisfaction, quality of care and health outcomes. While there is no single measure of patient-centred care, some common measures entail assessing communication and forming relationships. In addition, patient-centred care is better assessed by patients' experiences of care and the quality of their relationships with health workers. These are then compared with other data sources to overcome limitations associated with patient perception ratings.[43]

This study assessed a component of patient-centred care by examining the level of communication between healthcare workers and caregivers and caregivers' perceptions of the quality of care provided, in order to give some insight into how these may impact CMAM programme performance.

4.5.1 Communication between healthcare workers and caregivers

It was found that in Ifo and Hagadera refugee camps, respectively, 68.8% and 43.8% of caregivers had been informed by health workers of the nature of their children's illness, 46.9% and 1.6% had been told the duration their children would take to complete treatment, while 10.9% and 7.8% had been informed of the target weight their children should attain to be discharged. These findings were consistent with case studies conducted in Burma, Ivory Coast and South Sudan, which indicated a poor understanding among caregivers of the reason for admission and the duration their children would take to complete treatment.[13] Caregivers' poor knowledge of these may impact programme performance negatively due to treatment non-compliance and increased default rates.

When the communication of healthcare workers regarding therapeutic feeding to caregivers was assessed, most (84.4%) caregivers from Ifo refugee camp and slightly more than a half (57.8%) from Hagadera reported having been given details by health workers on therapeutic feeding. Despite the high percentage of caregivers from Ifo reporting that they had been given details on therapeutic feeds, a very small proportion of caregivers from both refugee camps knew the correct frequency for giving therapeutic feeds to their children. In addition, more than half and more than two-thirds of caregivers from Ifo and Hagadera refugee camps, respectively, reported giving their children other feeds besides therapeutic feeds.

These findings are suggestive of the need for improved communication and continued reinforcement to caregivers to ensure they give correct feeds and at the prescribed frequency. Caregivers' reported percentage scores from each component tested

suggests that the health workers in Ifo refugee camp exhibited a better level than those in Hagadera refugee camp.

4.5.2 Caregivers' perceptions of quality of care

Overall, the findings on caregivers' perceptions of health workers on their first day of reception, which measured whether health workers had time to attend to them, as well as their perceptions of healthcare workers' responses to their requests for child treatment, suggested that there were relatively better patient-centred care behaviours in Ifo refugee camp than in Hagadera refugee camp.

The findings on the caregivers' perceptions of whether their children were receiving satisfactory healthcare services, suggests more caregivers from Ifo refugee camp had positive ratings and perceptions about the programme's services than at Hagadera. Despite the fact that this is a preliminary study on caregivers' perceptions of the quality of care of CMAM services, the findings provide valuable insights into the trends of patient-centred care in an emergency context.

4.5.3 Additional caregivers' feedback on aspects of quality of care

In this study a simple component of a positive relationship initiated by health workers at first contact with caregivers was assessed. The findings of this study report a higher percentage of caregivers, about 70%, from both refugee camps having healthcare workers introduced to them. A greater percentage of caregivers (78%) from Ifo refugee camp than from Hagadera refugee camp (42.2%) reported having had the opportunity to enquire about their children's treatment process. Even though high numbers of caregivers reported a positive relationship established at first point of contact with healthcare workers in both refugee camps, less than half of the caregivers from Hagadera reported having had the opportunity to enquire about their children's treatment process. These findings provide insights into the dynamics of the rapport established between healthcare workers and caregivers, and their subsequent interactions regarding their children's treatment in these two refugee camps.[44,45]

In this study there were relatively lower numbers of caregivers from both refugee camps who had an opportunity to discuss their children's treatment goals, such as target weight or exit MUAC, and who had been provided with health status progress reports of their children by healthcare workers in previous visits to OTP. These findings were consistent with a study investigating factors associated with defaulting that found that there was poor communication of treatment goals.[14] Caregivers may be better motivated if encouraged to attend scheduled weekly visits and provided with regular feedback on their children's progress.

4.6 HYPOTHESIS TESTING

The hypothesis for this study was:
A relationship does not exist between caregivers' knowledge of treatment and default rates of children with SAM in SC and OTP.

The study findings indicate that the percentage mean scores for caregivers' knowledge of treatment objectives for both camps was good. However, there were no defaulters. Therefore, the findings of this study rejected the null hypothesis.

4.7 CONCLUSION

Caregivers play a major role in the treatment of children with acute malnutrition. There are limited studies available on factors that are likely to enhance caregivers' involvement in the treatment of severe acute malnutrition to improve compliance and result in better treatment outcomes. The findings of this study provided preliminary insights on how caregivers' knowledge may influence their compliance to treatment and affect their children's treatment outcomes. In addition, they provided insights on how caregivers' perceptions on quality of health services their SAM children receive may affect their satisfactions and compliance to treatment. Therefore, the delivery of CMAM services that effectively incorporate patient-centred care principles may provide a promising approach for scaling up the performance of the CMAM programme.

4.8 LIMITATIONS OF THE STUDY

The findings of this study could only be generalised to the refugee population studied. In addition, lack of prior studies in patient-centered care in CMAM programmes posed challenges in designing an appropriate methodology to assess patient-centred communication in CMAM programmes.

4.9 RECOMMENDATIONS FOR FUTURE RESEARCH

More research is needed on the factors that may affect caregivers' understanding of their children's treatment objectives on CMAM programmes in emergency and non-emergency contexts and how it may influence treatment outcomes. Studies with large study sample to assess relationship between caregivers' education level and treatment outcomes of severe acute malnutrition are needed.

More studies to evaluate how the integration of patient-centred care in CMAM programs may improve their performance are needed. Further studies are recommended on routine medication (antibiotics) prescriptions among children with acute malnutrition, its administration and adherence, and how it affects recovery. Qualitative studies on caregivers' perceptions of CMAM services and their effect on treatment outcomes, such as average weight gain, length of stay and coverage rates, would also be beneficial.

REFERENCES

1. Shoham J, Dolan C, Gostelow L. Managing Acute Malnutrition at Scale: A review of Donor and Government Financing Arrangements. Humanitarian Practice Network. [Online] 2013;75:1-10 [accessed 2013 6 January]; Available from: http://odihpn.org/wp-content/uploads/2013/05/NP75_cover_web.pdf

2. WHO. Community-based Management of Severe Acute Malnutrition: A Joint Statement by World Health Organization, the World Food Programme, the United Nations System Standing Committee on Nutrition and the United Nations Children's Fund. [Online] 2007 [accessed 2012, 15 July]; Available from: www.who.int/child_adolescent_health/documents/.../en/index.html

3. Prudhon C, Briend A, Prinzo WZ, Daelmans B, Mason, BJ. WHO, UNICEF and SCN Informal Consultation on Community-based Management of Severe Malnutrition in Children. [Online] 2007 [accessed 2012, 15 August]; Available from: http://www.who.int/nutrition/publications/severemalnutrition/FNB_0379-5721.pdf

4. Kenya National Bureau of Statistics. Kenya Demographic and Health Survey 2014. [Online] 2014[accessed 2017 23 January]; Available from: https://dhsprogram.com/pubs/pdf/fr308/fr308.pdf

5. Government of Kenya National Guideline for Integrated Management of Acute Malnutrition. Nairobi: Ministry of Medical Services and Ministry of Public Health & Sanitation; 2009

6. Doocy S, Tappis H, Haskew C, Wilkinson C, Spiegel, P. Performance of UNHCR Nutrition. [Online] 2011 [accessed 2012, 30 August]; Available from: www.conflictandhealth.com/content/pdf/1752-1505-5-23

7. Tekeste A. Wondafrash M, Azene G, Deribe K. Cost Effectiveness of Community-based and In-patient Therapeutic Feeding Programs to Treat Severe Acute Malnutrition in Ethiopia. Cost Effectiveness and Resource Allocation [Online] 2012;10:4. [Accessed 2012, 25 September]; Available: http://www.resource-allocation.com/content/10/1/4

8. Sadler K, Myatt M, Feleke T, Collins S. A Comparison of the Programme Coverage of Two Therapeutic Feeding Interventions Implemented in Neighbouring Districts of Malawi. Jr of Public Health Nutrition. [Online] 2007; 10(9):907-13. Available from: [Accessed 2012, 16 September]; Available from: https://www.ncbi.nlm.nih.gov/pubmed/17466097

9. Briend A, Collins S. Therapeutic Nutrition for Children with Severe Acute Malnutrition: Summary of African Experience. Jr of Indian Ped. [Online] 2010;47:656-659 [accessed 2012,29 August]; Available from: http://medind.nic.in/ibv/t10/i8/ibvt10i8p655.pdf

10. Emergency Nutrition Networks. Module 13: Management of Acute Malnutrition. [Serial on CD-ROM] 2011 [accessed 2012, 1 September]: Emergency Nutrition Networks Harmonized training package (HTP).

11. Helen Keller International. Community-based Management of Acute Malnutrition (CMAM).[Online] 2009 [accessed 2012 17 July]; Available from: http://65.181.121.234/research/HKI%20CMAM%20Program%20Approach%206%2016%2009.pdf

12. UNICEF. Evaluation of Community Management of Acute Malnutrition (CMAM) Ethiopia Country Case Study. [Online] 2012 [accessed 2013 21 February]; Available from: http://www.unicef.org/evaldatabase/files/CMAM_Final_Ethioia.pdf

13. FANTA. Module One: Community-based Management of Acute malnutrition. [Online] n.d [accessed 2012 7 July]; Available from: http://www.fantaproject.org/sites/default/files/resources/CMAM_Training_Mod1_ENGLISH_Nov2008.pdf

14. Velden E. Improving default-rates in ambulatory therapeutic feeding programmes in operations by Médecins Sans Frontières - Operational Centre Amsterdam [master's thesis]. [Online] 2008 [accessed 2012, June]; Available from: http://www.bibalex.org/search4dev/files/350721/183306.pdf

15. Schoonees A, Lombard M, Musekiwa A, Nel E, Volmink J. Ready-to-use therapeutic food for home-based treatment of severe acute malnutrition in children from six months to five years of age. Cochrane Database Syst Rev. [Online] 2013;6:47-48 [accessed 2012,5 June]; Available from: http://Onlinelibrary.wiley.com/doi/10.1002/14651858.CD009000.pub2/epdf/standard

16. Collins S, Tanner CG. Community Therapeutic Care (CTC): A New Approach to Managing Acute Malnutrition in Emergencies and Beyond. Food and Nutrition Technical Assistance, Technical Note 8 [Online] 2004 [accessed 22 June]; Available from:http://www.eldis.org/vfile/upload/1/document/0708/DOC17926.pdf

17. Sphere Project. Humanitarian Charter and Minimum Standards in Disaster Response. Aosta: Musumeci [Online] 2011 [accessed 11 June]; Available from: http://www.ifrc.org/Docs/idrl/I283EN.pdf

18. Irena HA, Mwambazi M, Mulenga V. Diarrhoea is a Major Killer of Children with Severe Acute Malnutrition Admitted to In-patient Set-up in Lusaka, Zambia. Jr. Nutr [Online] 2011;10:110. [Accessed 204, 16 April]; Available from: http://www.pubfacts.com/detail/21989455/Diarrhea-is-a-major-killer-of-children-with-severe-acute-malnutrition-admitted-to-inpatient-set-up-i

19. Velden E. Improving default-rates in ambulatory therapeutic feeding programmes in operations by Médecins Sans Frontières - Operational Centre Amsterdam [master's thesis]. [Online] 2008 [accessed 2012, June]; Available from: http://www.bibalex.org/search4dev/files/350721/183306.pdf

20. Ouma C, Madara G. Dadaab Refugee Camps: Nutrition Programmes Coverage Survey. Inter-agency Nutrition Coverage Survey Report, 2010.

21. UNHCR. Nutrition surveys in Dadaab Refugee Camps: Hagadera, Ifo Dagahaley Camps and Dagahaley outskirts. [Online] 2011 [accessed 2012 17 June]; Available from: https://www.humanitarianresponse.info/system/files/documents/files/HelpAge%20Dadaab%20Nutrition%20Survey%202011.pdf

22. Morroni C. Myer L. Study design. In Joubert G, Ehrlich R (Ed.) Epidemiology: A Research Manual For South Africa, 2nd Ed. Cape Town: Oxford University Press Southern Africa; 2007. P. 79

23. Jayadevappa R, Chhatre S. Patient-centred care – A conceptual model and review of the state of art. Jr open health services and policy [Online] 2011; 4:15-25 [accessed 2012 23 August]; Available from: http://benthamopen.com/contents/pdf/TOHSPJ/TOHSPJ-4-15.pdf

24. Epstein MR, Street R. Patient-Centered Communication in Cancer Care: Promoting and Reducing Suffering. National Cancer Institute , NIH Publication No. 07-6225 [Online] 2007 [accessed 2012 15 July]; Available from: http://appliedresearch.cancer.gov/areas/pcc/communication/pcc_monograph.pd

25. WFP, UNHCR Joint Assessment Mission – Kenya Refugee Operation Dadaab (23 - 27 June 2014) and Kakuma (30 June – 1 July 2014) Refugee camps. [Online] 2014[accessed 2016 13 September]; Available: http://www.unhcr.org/54d3762d3.pdf

26. Ygge BM A,rnetz JE.Quality of paediatric care: application and validation of an instrument for measuring parent satisfaction with hospital care. Int J Qual Health Care [Online] 2001;13(1):33-43[accessed 2013, 17 April] Available from: https://www.ncbi.nlm.nih.gov/pubmed/11330441

27. Jenny F,Tracey Y.Correlation coefficient: association between two continuous variables. [Online] 2009 [accessed 2014, 17 July] Available: from: http://www.shef.ac.uk/polopoly_fs/1.43991!/file/Tutorial-14-correlation.pdf

28. Jerzy S. Analysis of questionnaires and qualitative qata-non-parametric tests. [Online] 2013 [accessed 2014, 22 August] Available from:http://www.cs.put.poznan.pl/jstefanowski/sed/DM12-nonparemetrictests.pdf

29. Crisol E. Javier G, Gilbert L, Abril R, Diana S.Ethical Issues with Informed Consent. Jr of E-Zine [Online] 2007:1[accessed 2013,21 March] Available from: http://cstep.cs.utep.edu/research/ezine/EzineEthicalIssueswithInformedConsent.pdf

30. Ezekiel E, Emily A.Leanne S. Research ethics: How to treat people who participate in research. [Online] 2010 [accessed 2013 , 21 March] Available from:http://bioethics.nih.gov/education/FNIH_BioethicsBrochure_WEB.PDF

31. Mufth S.Out-patient management of severe acute malnutrition among children under five years old, in Yemen: a retrospective cohort study. Inter Jr Cont Paediatr [Online] 2016;3:(2) 445-451.[accessed 2016, 20 June]; Available: http://www.cmamforum.org/Pool/Resources/Outpatient-management-SAM-U5s-Yemen-retrospect-cohort2016.pdf

32. Desalegn M, Kifle W, Birtukan T, Amanuel T. Treatment outcome of severe acute malnutrition and determinants of survival in Northern Ethiopia: A prospective cohort study.Int. J. Nutr. Metab.[Online] 8 (3):12-23.[accessed 2016, 15 July]; Available: http://www.academicjournals.org/journal/IJNAM/article-full-text-pdf/530B79E58334

33. Krishnavathana H, Rubina AH . Glycemic Control in Pediatric Type 1 Diabetes: Role of Caregiver Literacy. Jr. Pead. [Online] 2010;125(5) : [Accessed 2016, 9 September]; Available: http://pediatrics.aappublications.org/content/pediatrics/125/5/e1104.full.pdf

34. Kendall C, Nigusse D, Lemma W. Outpatient Therapeutic Feeding Program Outcomes and Determinants in Treatment of Severe Acute Malnutrition in Tigray, Northern Ethiopia: A Retrospective Cohort Study. PLoS ONE [Online] 2013; 8(6):. [accessed 2016, 20 July]; Available:Vol.125 (5) 2010 http://journals.plos.org/plosone/article/asset?id=10.1371/journal.pone.0065840.DF

35. Mahdi Z, Ali A. Prevalence of Malnutrition among Children under 5 Years at El Geneina Internally Displaced Population Camp. [Online] 2013. [accessed 2016, 6 September] Available from: http://khartoumspace.uofk.edu/handle/123456789/19503

36. Yebyo HG, Kendall C, Nigusse D, Lemma W. Outpatient Therapeutic Feeding Program Outcomes and Determinants in Treatment of Severe Acute Malnutrition in Tigray, Northern Ethiopia: A Retrospective Cohort Study. PLoS ONE [Online] 2013; 8(6) [accessed 2014, 13 June] : Available: doi:10.1371/journal.pone.0065840. 2013

37. Dorothy M, Lucy KB , Anna KK, Boniface O, Michael H. Outcomes of Severely Malnourished Children Aged 6 - 59 Months on Outpatient Management Program in Kitui County Hospital, Kenya. Open Jr of Pediatr [Online], 2015; 5, 326-333.[accessed 2016, 21 July] Available : http://file.scirp.org/pdf/OJPed_2015122513485506.pdf

38. Seife KT. Tackling high defaulting rates in refugee camp settings – lessons from Chad. [Online] 2014 [accessed 2016 10 August] Available: http://www.ennOnline.net/nex/4/en/tackling

39. Shanka NA, Lemma S, Abyu DM.Recovery Rate and Determinants in Treatment of Children with Severe Acute Malnutrition using Outpatient Therapeutic Feeding Program in Kamba District, South West Ethiopia. J Nutr Disor [Online] 2015; 5:155. [accessed 2016, 29 July]; Available: doi:10.4172/2161-0509.1000155

40. Kambale RM,Kasengi J.B,Kivukuto JM,Cubaka LM,Mungo BM, Balaluka GB. Infectious profile and mortality of children aged 0-5 years admitted with severe acute malnutrition: a retrospective cohort study conducted in the Therapeutic Nutritional Centre in Bukavu, Republic of Congo. Pan Afr Med J. [Online] 2015: 28;23:139.[accessed 2016,30 June]; Available: https://www.ncbi.nlm.nih.gov/pubmed/27279964

41. Singh P,Kumar P, Rohatgi S, Basu S Aneja S. Experience and Outcome of Children with Severe Acute Malnutrition Using Locally Prepared Therapeutic Diet.Indian J Pediatr [Online] 2016;83(1):3-8.[accessed 2015, 4 May]; Available: https://www.ncbi.nlm.nih.gov/pubmed/26153390

42. Binns, PJ, Dale NM, Banda T, Banda C, Shaba B, Myatt. M. Safety and practicability of using mid-upper arm circumference as a discharge criterion in community based management of severe acute malnutrition in children aged 6 to 59 months programmes. Arch Public Health. [Online] 2016; 74:24.[Accessed 2016, 5 August]; Available: http://www.ncbi.nlm.nih.gov/pubmed/27307989

43. Ronald ME, Kevin F, Cara SL, Kurt CS. Why The Nation Needs A Policy Push On Patient-Centered Health Care. Health Affairs [Online] 2010; (29)8: 1489–95.[access 2015,12 August] Available: doi:10.1377/hlthaff.2009.0888

44. Julie BM, Jennifer JG, Cleveland GS. Patient-centered care and breast cancer survivors' satisfaction with information.[Online] 2005:57(3) [accessed 2016, 9 September] Available :http://www.sciencedirect.com/science/article/pii/S0738399104003131

45. Ross L. Facilitating Rapport through Real Patient Encounters in Health Care Professional Education. Austr Jr of Par [Online] 2013;10;4 [accessed 2016, 10 September]; Available: https://ajp.paramedics.org/index.php/ajp/article/view/50

Appendix A: Questionnaire 1(SC)

CHILDREN'S ANTHROPOMETRIC AND CLINICAL ASSESSMENT & CAREGIVERS' KNOWLEDGE ASSESSMENT ON MEDICAL AND NUTRITION TREATMENT OBJECTIVES QUESTIONNAIRE [SC]

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

Section A is to be filled in ONCE for the children on their first day of Phase II in the SC **Section A** **Tick the appropriate box with X or write the response in the space provided** **1.0 Socio-demographic data of the child** 1.1 Sex: 1. Male □ 2. Female □ 1.2 Age (dd/mm/yy)___/___/____ 1.3 Number of siblings: …… 1.4 Relationship to the caregiver: …… 1.5 Date of admission: (dd/mm/yy)…… **2.0 Socio-demographic data of the caregiver** 2.1 Sex: 1. Male □ 2. Female □ 2.2 Age: …… 2.3 What is the highest level of education of the caregiver? 1. Informal □ 2. Primary level □ 3. Secondary level □ 4. College □ **3.0 Clinical and anthropometric assessment** 3.1 Child diagnosis: 1. Kwashiorkor □ 2. Marasmus □ 3. Marasmic-kwashiorkor □ 3.2 Presence of nutritional oedema? 1. Yes □ 2. No □ 3.3If yes, please indicate the grade: 1. Grade + □ 2. Grade ++ □ 3. Grade+++ □ 3.4 Record the child's admission weight and target weight in grams , length and MUAC measurements in centimeters in the **Table 1** attached [*The interviewer should record clinical and anthropometric assessment of the child at admission from the child's SC admission card and also verify by doing her/his own assessment and note any discrepancies here below*] …… **[Caregiver's knowledge on medical & nutrition treatment objectives]** **4.0 Medical and nutrition treatment objectives** 4.1Do you know the reason why your child was admitted in SC? 1. Yes □ 2. No □ 4.2 If yes, what was the reason?.....	For official use

4.3 Were you informed by health worker (who attended to you the first time you came to the SC) the illness your child is suffering from?

1.Yes□ 2. No□

4.4 Did the health worker who attended to you when your child was admitted tell you the weight your child must reach (or gain) in order to be discharged?

1.Yes□ 2. No□

4.5 If yes, please state(*weight in kg*) _____

4.6 Were you informed by the health worker who admitted you the MUAC measurement your child should attain in order to be discharged?

1. Yes□ 2. No□

4.7 If yes above, state the MUAC measurement (in cm)_____ or MUAC colour code

When the child reaches the Red MUAC colour code ……1
When the child reaches the Yellow MUAC colour cod…….2
When the child reaches the Green MUAC colour code…..3

4.8 For how long do you expect your child to remain in SC while receiving treatment?

Less than one week ……1
1 week……..2
2 weeks……3
Less than one month……4
More than one month……...5
Do not know……6

4.9 Did the health worker, when you were being admitted, explained to you duration your child may require treatment?

Yes□ 2. No□

4.10 If yes, please state approximate duration.

1 week……..……...1
2 Weeks……..……2
Less than one month…….3
One month……4
Two months…..……5
Do not remember…..……6

4.11 Were you explained by health worker the type of food your child will be given from the SC to feed on to get well?

1. Yes□ 2. No□

4.12 If yes, please state what you were told about this feed…….
…….

4.13 Can you remember how much of this therapeutic feed you are supposed to give your child per day?

1. Yes□ 2. No□

4.14 If yes, state how much feed the child should be given per day ……..

4.15 Do you know how many times your child should be given this feed in a day?

1. Yes□ 2. No□

4.16 If yes above, please state how many times should the child be given the

feed
per day……

4.17 Cross-check prescribed feed, amount and frequency from feeding chart and comment against what caregiver expresses……
……...

4.18 Do you give your child anything else to eat apart from this feed you are given from here ?
1. Yes ☐ 2. No ☐
4.19 If yes, state some of the foods you often give your child beside what you are given here to feed your child on by health workers

Anjela……..1
Milk…….2
Porridge……...3
Rice……..4
Ugali……..5
Other [specifiy}…….6

4.20 Please state how often do you give the type of food you have mentioned above per day

Once per day……1
Twice per day……...2
Thrice per day……..3
More than thrice per day……...4

4.21 Why is it important to cover your child well at night and when the weather is cold to keep him/her warm?

They are thin and weak……1
They can die easily if exposed to cold……....2
They are not able to cover themselves……..…..3
Do not know…….…….4
Other [Specify]……..…5

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

Section B

This section will be filled in every day after the first day of the study in SC until the child is discharged as 'Cured' or has defaulted.

Table 1: Anthropometric Assessment

	Weight* (gm)	Length (cm)	MUAC (cm)	Nutritional Oedema* (+.++,+++)
At admission				
Targeted				
Day 1				
Day 2				
Day 3				
Day 4				
Day 5				
Day 6				
Day 7				
Day 8				
Day 9				
Day 10				
Day 11				
Day 12				
Day 13				
Day 14				
Day 15				
Day 16				
Day 17				
Day 18				
Day 19				
Day 20				
Day 21				

**Children with oedema their weight will be corrected accordingly*

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

5.0 Nutrition Support

Table 2: Type, quantities and frequency of therapeutic feeds child receives everyday

Check on child's feeding chart in the medical file to find out the feed prescribed, frequency and quantities per day and observe during feeding time the actual quantities and frequency the caregiver gives the child per day and record in this table.

Duration	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20
Child's weight (kg)																				
Type of feed																				
Prescribed quantities																				
Actual quantities																				
Prescribed frequency																				
Actual frequency																				

Comment on the observed discrepancies between actual and prescribed amount of feed and frequency

……

……

Appendix B: Questionnaire 2 (SC)

CAREGIVERS' PERCEPTIONS OF QUALITY OF CARE ASSESSMENT QUESTIONNAIRE [SC]

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

To be filled when child reach Phase II in the SC immediately after completion of antibiotics dosage **<u>Tick the appropriate box with X or write the response in the space provided</u>** 1.0 Did the health workers , that are involved in treatment of your child introduce themselves to you at admission? 1. Yes □ 2. No □ 1.1 Were you informed what conditions your child was suffering from? 1. Yes □ 2. No □ 1.2 If yes, state the condition…….. 1.3 Were you informed what kind of special feed your child will be given to eat in order to get well? 1. Yes □ 2. No □ 1.4 If yes, state the name of that special feed ……. 1.5 Did health worker give you instructions on how you should give your child the special feed? 1. Yes □ 2. No □ 2.0 While your child receives treatment, do you have opportunity to ask some questions regarding your child treatment process? 1. Yes □ 2 No □ 2.1 If yes, what are kind of questions regarding your child treatment process did you have an opportunity to ask? About medication……1 About therapeutic feeds…….2 About child health progress……3 Other [Specify]…….4	For official use

2.2 How would you rate the way health workers respond to your requests concerning to your child needs while receiving treatment here ?

1. Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good

2.3 What are the reasons that made you rate the health workers in the above?

……

……

2.4 Do you feel that the health workers have time for you and your child?

1. Yes □ 2. No □

2.5 If no, explain why…….

2.6 Do you think your child is receiving satisfactory treatment in the program?

1. Yes □ 2. No □ 3. Unsure □

2.7 Do you think health workers attending to your child have adequate skills?

1. Yes □ 2. No □ 3. Unsure □

3.0 How would you rate the way you were treated by health workers while your child was receiving treatment?

1. Very poor □ 2. Poor □ 3. Neutral 4. Fair □ Good □ 5. Very good □

3.1 Do you feel that your child have been treated well when she/ he was in contact with the health workers in the program? 1. Yes □ 2. No □

3.2 If no, please explain why……

3.3 How would you rate how you and your child were received on the first day in the program ?

1.Very poor □ 2. Poor □ 3. Neutral □ .4Fair □ 5. Good □ 6.Very Good

3.4 Kindly give the reason for the answer provided above (*probe for response*)

……..

4.0 Did the health workers give information regarding the child's illness at previous visit?

1. Yes □ 2. No □

4.1 If yes, do you understand the information provided to you by the health workers about your child's illness 1.Yes □ 2. No □

4.2 Have the health workers been informing you about your child's health progress since your child was admitted here?

1. Yes □ 2. No □ 4.3 Do you have the opportunity to participate in discussion concerning your child's treatment progress? 1. Yes □ 2. No □ 4.4 Did you have the opportunity to discuss the goals of your child's treatment with the health workers at admission in respect to child's target weight and target MUAC measurement? 1. Yes □ 2. No □ 4.5 If yes, state the anticipated: Target weight …… Target MUAC measurement…..or MUAC colour code…….. 5.0 Do you think this program has an adequate number of health workers to serve you? 1. Yes □ 2. No □ 5.1 How would you rate the services provided in this program? 1. Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good 5.2 What are the reasons that have influenced your rating above …… …… 5.3 How would you rate working climate among the health workers serving you in the program? 1. Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good	

Appendix C: Questionnaire 3

DEFAULTER ASSESSMENT QUESTIONNAIRE - SC/OTP

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

For official use

This section is to be filled in ONCE for the children confirmed to have defaulted (if caregiver absconds for three consecutive days).

Tick the appropriate box with X or write the response in the space provided

a) Child Details

1.1 Sex: 1. Male ☐ 2. Female ☐

1.2 Age: …….

1.3 Date of admission.. (dd/mm/yy)……../…../……

1.4 Health Facility child was admitted……..

1.5 Date of the last visit in the program (dd/mm/yy)…../…../…../

2.0 Anthropometric assessment data (on the last visit before defaulting)

(*Please check child's anthropometric and clinical assessment sheet to fill in the following details*)

Weight (kg)	Length (cm)	Height (cm)	MUAC (cm)	Oedema	Corrected weight

Caregivers' Assessment on Reasons for Defaulting

b) From your own perception, why was your child admitted to the SC/OTP?

.....

3.1 What do you think is the cause of your child's illness?

……

3.2 What did you like in the place where your child was receiving treatment?

Health workers were welcoming……1

Health workers attended us immediately once we arrived……2

There was good management of the crowd……....3

My child was attend well by health workers ……..4

Other……..5

3.3 What did you not like in the place where your child was receiving treatment?

Health workers were unwelcoming……1

There was poor crowd control……2

My child was not attended well by health workers……3

Health workers were not available to timely attend my child on arrival ….4

My child was not getting better……..5

I was spending too much time away from home/work…….6

Other [specify……]…7

3.4 Do you think health workers who were treating your child have adequate skills?

1. Strongly disagree □ 2.Disagree □ 3. Neutral □ 4.Agree □ 5. Strongly agree □

3.5 What are the reasons which have made you to provide above answer?

……..

…….

3.6 At home, who decided that you should take the child for treatment?

Father ……1

Mother ……..2

Grandfather……3

Relatives ……4

Neighbour……5

Other [Specify……..]……..6

3.7 In your community who decides WHERE to seek health treatment when the child is sick?

Village Elder……1

Sheikh ……2

Midwife ……3

Other [Specify]……..……4

3.8 In your community who decides WHEN to seek health treatment when

the child is sick?

Village Elder……..1

Sheikh ……...2

Midwife…….3

Other [Specify…….]……..4

3.9 Did the health worker who attended to you when your child was admitted tell you the weight your child must attain (gain?) in order to be discharged?

1. Yes ☐ 2. No ☐

3.10 If yes, please state ……

3.11 Were you informed by the health worker who admitted your child, the MUAC measurement your child should attain in order to be discharged?

1 Yes ☐ 2. No ☐

If yes, a) state the weight…….

b) state the MUAC measurement (in cm)_____ or MUAC colour

When the child reaches the Red MUAC colour code……1

When the child reaches the Yellow MUAC colour code……2

When the child reaches the Green MUAC colour code……..3

3.13 What are the reasons for your child to no longer attend the program?

a) My child was no longer sick……1

b) The distance was far I got tired of walking……..……2

c) Child weekly visit day coincides with the day of collecting general food ration for the family……3

d) I became busy with other household's activities……4

e) It was not safe to walk to health facility due to insecurity……..5

f) Health workers were not welcoming ……6

g) Other

[Specify……..……...7

Appendix D: Questionnaire 1 (OTP)

CHILDREN'S ANTHROPOMETRIC AND CLINICAL ASSESSMENT & CAREGIVERS' KNOWLEDGE ASSESSMENT ON MEDICAL AND NUTRITION TREATMENT OBJCETIVES QUESTIONNAIRE [OTP]

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

Section A is to be filled in ONCE during second visit	For official use
Section A	
Tick the appropriate box with x or write the response in the space provided	
3 Socio-demographic data of the child	
1.1 Sex: 1. Male □ 2. Female □	
1.2 Age: (dd/mm/yy) ……./…./……..	
1.3 Number of siblings: …….	
1.4 Relationship to the caregiver: ……..	
1.5 Date of admission: (dd/mm/yy)……..	
2.0 Socio-demographic data of the caregiver	
2.1 Sex: 1. Male □ 2. Female □	
2.2 Age: …….	
2.3 What is the highest level of education of the caregiver?	
1. Informal □ 2. Primary level □ 3. Secondary level □	
4. College □	
2.0 Clinical assessment	
1.1Child diagnosis	
1. Kwashiorkor □ 2. Marasmic-Kwashiorkor 3. Marasmus □	
1.2Presence of nutritional edema?	
1.Yes □ 2. No □	
2.3 If yes, please indicate the grade:	

1. Grade + □ 2. Grade ++□ 3. Grade+++□

2.4 Record the child's admission weight and target weight in kg , length and MUAC measurements in centimeters in the **Table 1** on the sheet attached.

[*The interviewer should record clinical and anthropometric assessment of the child at admission from the child's OTP admission card and also verify by doing her/his own assessment and note any discrepancies here below*]

…….

……..

3.0 Routine Medication given at home

3.1 Do you have any medication you were given to give the child [name of the child] at home? [**if no go to question 4**]

Yes□ 2. No□

3.2 If yes above, what dosage of medication (s) are you giving the child?

Type……Dose……..……

Type……Dose……..……

Type……Dose……..……

(*Please crosscheck from OTP Admission card to verify the type of routine medication given and dosage*).

3.3 Tick appropriately the response given by the caregiver on the above questions on medication are:

1. Correct □
2. Incorrect □

[Caregiver's knowledge on medical & nutrition treatment objectives]

4.0 Medical and nutrition treatment objectives

4.1 Do you know the reason why your child was admitted in OTP?

1. Yes □ 2. No □

4.2 If yes, what was the reason?.....

4.3 Were you informed by the health worker the illness your child is suffering from?

1.Yes□ 2. No□

4.4 Did the health worker who attended to you when your child was admitted tell

you the weight your child must reach (or gain) in order to be discharged?

1.Yes□ 2. No□

4.6 If yes, please state(*weight in kg*) _____

4.7 Were you told by the health worker during admission what MUAC measurement your child will attain in order to be discharged?

1. Yes□ 2. No□

4.8 If yes above, state the MUAC measurement (in cm)_____ or MUAC colour code

When the child reaches the Red MUAC colour code……..1

When the child reaches the Yellow MUAC colour code……2

When the child reaches the Green MUAC colour code……..3

4.9 For how long do you expect your child to remain in OTP while receiving treatment?

Less than one week……..1

1 week……2

2 weeks……...3

Less than one month……4

More than one month ……..5

Do not know……6

4.10 Did the health worker, when you were being admitted, explained to you duration your child may take to get treatment here?

1. Yes□ 2. No□

4.11 If yes, please state approximate duration.

1 week……..1

2 Weeks……2

Less than one month……3

One month……4

Two months……..5

Do not remember……...6

4.12 Were you explained by health worker the type of food your child will be given from the OTP to feed on to get well?

1. Yes ☐ 2. No ☐

4.13 If yes, please state what you were told about this feed……..……..…….

4.14 Can you remember how much of this therapeutic feed you are supposed to give your child per day?

1. Yes ☐ 2. No ☐

4.15 If yes, state how much feed the child should be given per day ……..

4.16 Do you know how many times your child should be given this feed in a day?

1. Yes ☐ 2. No ☐

4.17 If yes above, please state how many times should the child be given in a day ……..

4.18 Comment on the noted discrepancies between actual amount and frequency said to be given against prescribed amount of feeds and required frequency …….....

.....

.....

4.19 Do you give your child anything else to eat apart from this feed you are given from here ?

1. Yes ☐ 2. No ☐

4.20 If yes, state some of the foods you often give your child beside what you are given here to feed your child on by health workers

Anjela……..1

Milk…….2

Porridge……3

Rice …….4

Ugali……..5

Other (Specify)……6

4.21 Why is it important to cover your child well at night and when the weather is cold to keep him/her warm?

They are thin and weak ……1

They can die easily if exposed to cold……2

They are not able to cover themselves…… …3 Do not know……..4 Other [Specify……..]……..……...5	

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

Section B

Section B is to be filled in every scheduled weekly visit until the child is discharged as 'CURED' or has defaulted

Table 1: Anthropometric assessment

	Weight (Kg)	Length (cm)	MUAC (cm)	Nutritional Oedema * (+.++,+++)
At admission				
Targeted				
Week 1				
Week 2				
Week 3				
Week 4				
Week 5				
Week 6				
Week 7				
Week 8				
Week 9				
Week 10				
Week 11				
Week 12				
Week 13				
Week 14				
Week 15				
Week 16				
Week 17				
Week 18				

**Children with oedema their weight will be corrected accordingly*

5.0 Nutrition Support

Table 2: Check the outcome of the appetite test for each visit

(*This data will be recorded as the interviewer observes health worker conduct the appetite test and its final outcome*)

Visit	Present*	Good	Poor	Refused	Action Taken*
Week 1					
Week 2					
Week 3					
Week 4					
Week 5					
Week 6					
Week 7					
Week 8					
Week 9					
Week10					

Present*_ Check (√) if child present and write 'A' if child absent.

Note: A child absent for three consecutive visits is considered as defaulter.

Action taken* _ Indicate R for referral to SC, or CT for- continued with treatment

Appendix E: Questionnaire 2 (OTP)

CAREGIVERS' PERCEPTIONS ON QUALITY OF CARE ASSESSMENT QUESTIONNAIRE [OTP]

Questionnaire ID _/__/__/__ Child Reg. No…….. Date: (dd/mm/yy) __/__/___

To be filled in during FOURTH CHILD'S weekly visit in the OTP	For official use
Tick the appropriate box with X or write the response in the space provided 1.0 Did the health workers that are involved in treatment of your child introduce themselves to you at admission? 1. Yes ☐ 2. No ☐ 1.1 Were you informed what conditions your child was suffering from? 1. Yes ☐ 2. No ☐ 1.2 If yes, state the condition…….. 1.3 Were you informed what kind of special feed your child will be given to eat in order to get well? 1. Yes ☐ 2. No ☐ 1.4 If yes, state the name of that special feed ……. 1.5 Did health worker give you instructions on how you should give your child the special feed? 2. Yes ☐ 2. No ☐ 2.0 While your child receives treatment, do you have opportunity to ask some questions regarding your child treatment process? 2. Yes □ 2 No □ 2.1 If yes, what are kind of questions regarding your child treatment process did you have an opportunity to ask? About medication……1 About therapeutic feeds…….2 About child health progress……3 Other [Specify…..…….]…….4	

2.2 How would you rate the way health workers respond to your requests concerning to your child needs while receiving treatment here ?

1. Very poor □ 2. Poor □ 3. Neutral □ 3. Fair □ 4.Good □ 5.Very Good

2.3 What are the reasons that made you rate the health workers in the above?

……

……

2.4 Do you feel that the health workers have time for you and your child?

1. Yes □ 2. No □

2.5 If no, explain why…….

2.6 Do you think your child is receiving satisfactory treatment in the program?

1. Yes □ 2. No □ 3. Unsure □

2.7 Do you think health workers attending to your child have adequate skills?

1. Yes □ 2. No □ 3. Unsure □

3.0 How would you rate how you were treated by health workers while your child was receiving treatment?

1. Very poor □ 2. Poor □ 3. Neutral 4. Fair □ 5.Good □ 6. Very good □

3.1 Do you feel that your child have been treated well when she/ he was in contact with the health workers in the program? 1. Yes □ 2. No □

3.2 If no, please explain why……

3.3 How would you rate how you and your child were received on the first day in the program ?

1.Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good

3.4 Kindly give the reason for the answer provided above (*probe for response*)

……..

4.0 Have the health workers been informing you about your child's health progress during previous visits ?

1. Yes □ 2. No □

4.1 Do you understand the information provided to you by the health workers

about your child's health progress 1.Yes □ 2. No □ 4.2 Do you have the opportunity to participate in discussion concerning your child's treatment progress? 1. Yes □ 2. No □ 4.3 Did you have the opportunity to discuss the goals of your child's treatment with the health workers at admission in respect to child's target weight and target MUAC measurement? 1. Yes □ 2. No □ 4.4 If yes, state the anticipated: Target weight …… Target MUAC measurement…..or MUAC colour code…….. 5.0 Do you think this program has an adequate number of health workers to serve you? 1. Yes □ 2. No □ 5.1 How would you rate the services provided in this program? 2. Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good 5.2 What are the reasons that have influenced your rating above …… …… 5.3 How would you rate working climate among the health workers serving you in the program? 1. Very poor □ 2. Poor □ 3. Neutral □ 4. Fair □ 5.Good □ 6.Very Good	

Appendix F: Consent Form (English)

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT: SEVERE ACUTE MALNUTRITION: THE EFFECT OF CAREGIVERS' KNOWLEDGE ON DEFAULT RATES AT DADAAB REFUGEE CAMPS, KENYA

REFERENCE NUMBER: S14/06/133

PRINCIPAL INVESTIGATOR: ALEXANDER MBOGO

ADDRESS: P.O. BOX, 429-01000, THIKA

CONTACT NUMBER: +254 723 479 996

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff or doctor any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Health Research Ethics Committee at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

WHAT IS THIS RESEARCH STUDY ALL ABOUT?

The study will be conducted at Dadaab Refugee Camps in Ifo Refugee Camp and Hagadera. The target population will be children between the ages of six months to fifty nine months receiving treatment in stabilisation centers (SC) and out-patient therapeutic centers (OTP).

This study requires one hundred and twenty eight (128) children together with their caregivers and you and your child are among those who have been selected and invited to participate in this study.

This research project aims at investigating factors that contribute to caregivers' knowledge of treatment provided to severely acutely malnourished children and how

their knowledge may promote quick recovery (reduced length of stay in the hospital) due to compliance to the treatment prescribed while minimizing defaulting rates in efforts to reduce under-fives mortality rates related to acute malnutrition.

This study will involve taking weight, height and Mid-Upper-Arm-Circumference of the children selected on weekly basis during the study period. It will also seek to find out what the sick children are given to feed on as part of the treatment and also medication being provided. As the caregivers you will be interviewed on what you know about the treatment your children is receiving in the program.

WHY HAVE YOU BEEN INVITED TO PARTICIPATE?

You have been invited to participate in this study as you are the primary caregiver of the sick child and you are in better position to provide information which may be requested concerning treatment your child is receiving.

WHAT WILL YOUR RESPONSIBILITIES BE?

Your responsibilities in this research study will be to respond to questions which researcher will ask you about your child in relation to the treatment your child will be receiving. You will also be requested to assist to calm and assure the child during taking weight, height and weight.

This study will take a total of twenty one days if your child is in SC program. During this period, researcher will request you to provide information on how your child is feeding and also will take weight and MUAC measurements of your child every day. This will take a maximum of fifteen minutes.

If your child is in OTP, this study will take a total of eight weeks (two months). During this period of time, as you come for your normal weekly visits, researcher will request to interview you in order to gather information on how your child is feeding and also take weight, height and MUAC measurements of your child. This will take a maximum of fifteen minutes.

In addition, researcher will also at some point during the study request you to provide some information on your perception of quality of health care your child is receiving here and this will take about fifteen minutes.

WILL YOU BENEFIT FROM TAKING PART IN THIS RESEARCH?

There are no direct benefits which you or your child will get from participating in this study. However, the findings of this study are aimed to inform program decision-makers and health policy makers in order to improve management of severe acute malnutrition among children in future.

ARE THERE IN RISKS INVOLVED IN YOUR TAKING PART IN THIS RESEARCH?

Due to the nature of this research study, there are no foreseeable risks if you decide to participate in this research study.

IF YOU DO NOT AGREE TO TAKE PART, WHAT ALTERNATIVES DO YOU HAVE?

If you do not wish to participate in this research study, this will not affect you negatively in anyway whatsoever. Also, it will not affect your child negatively in provision of treatment services he or she is currently receiving in program.

WHO WILL HAVE ACCESS TO YOUR MEDICAL RECORDS?

The research investigator and research assistants will access your child's medical files to gather required data for this research study.

When you will be providing information, your identity will not be revealed during and after the interviews. Also, the information collected during the study will be treated with uttermost confidentiality and protected. If the report of this research will be required for publication or thesis, your identity and that of your child will remain anonymous.

WHAT WILL HAPPEN IN THE UNLIKELY EVENT OF SOME FORM OF INJURY OCCURRING AS A DIRECT RESULT OF YOUR TAKING PART *IN THIS RESEARCH STUDY?*

Due to the nature of this research study, there is no foreseeable event of some form of injury as direct result of your participation, and therefore no compensation will be anticipated.

WILL YOU BE PAID TO TAKE PART IN THIS STUDY AND ARE THERE ANY COSTS INVOLVED?

There will be no payment for participating in this study and there will be no costs involved for you, if you do take part.

IS THERE ANYTHING ELSE THAT YOU SHOULD KNOW OR DO?

- You can contact **Dr. Irene Ogada** at telephone: **+254723955466** if you have any further queries or encounter any problems.
- You can also contact the Stellenbosch University, Health Research Ethics Committee at **+27 021-938 9207** and or Kenyatta University , Research Ethic Committee at **+25420871-090-119** if you have any concerns or complaints that have not been adequately addressed by the researcher.
- You will receive a copy of this information and consent form for your own records.

Declaration by participant

By signing below, I ……..…… agree to take part in a research study entitled: ***Severe acute malnutrition: the effect of caregivers' knowledge on default rates at Dadaab Refugee camps, Kenya***

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to take part.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.
- I may be asked to leave the study before it has finished, if the study doctor or researcher feels it is in my best interests, or if I do not follow the study plan, as agreed to.

Signed at (*place*) .....…..…….. on (*date*) ……...…….. 2015

....

Signature of participant **Signature of witness**

Declaration by investigator

I *(name)* ……..…… declare that:

- I explained the information in this document to ……..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use a interpreter. (*If a interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) .....…..…….. on (*date*) …..…...…….. 2015

....

Signature of investigator **Signature of witness**

DECLARATION BY INTERPRETER

I *(name)* ……..…… declare that:

- I assisted the investigator (*name*) ……. to explain the information in this document to (*name of participant*) ……..…….. using the language medium of Somalia.
- We encouraged him/her to ask questions and took adequate time to answer them.
- I conveyed a factually correct version of what was related to me.
- I am satisfied that the participant fully understands the content of this informed consent document and has had all his/her question satisfactorily answered.

Signed at (*place*) .....…….. on (*date*) ……...…….2015

....

Signature of interpreter **Signature of witness**

Appendix G: Consent Form (Somali)

WARQADA MACLUUMAADKA KA QAYB QAATAHA IYO FOOMKA OGOLAANSHO SIINJA

CINWAANKA MASHRUUCA CILMI BAARISTE: SEVERE ACUTE MALNUTRTION (Nafaqoxumo aad udaran): NATIIJADA AQOONTA XANAANEYAHA KULEEDAHAY CADADA FULIN LA'AANJA EE XEROOYIINKA QAXOOTIGA EE DADAAB, KENYA.

LAMBARKA TIXRAACA: S14/06/133.
MAAMULAHA (ILIMBAARISTA): ALEXANDER MBOGO
CINWAANKA BOOSTADA: P.O.BOX, 429-0100, THIKA
LAMBARKA XIRIIRKA: +254723479996

Waxaa laguugu casumayaa idaad ka qayb qaadato mashruuca cilmi baarista qaada waqti waqti kugufilan oo aad ku aqriso akhbaarta halkam lagugu soo bandhigay. Taasa macneyn doonto faah faahinta mashruucan.

Fadlan weydi shaqaalaha baaristan ama dhaqtarka wixxi su'aalo ah ee la xiriira qayb kasta ee mashruucan kamid ah oo si buuxda u famin. Aad ayey muhiim utahay in aad si buuxdo ugu qanacdo si cadna ufahanto waxa cilmi baaristan ubaahantahay iyo sida aad ooga qayb qaadan karto. Sidoo kale , ka qayb qaadashadaada waa mid gebiba ikaa ah xor ayaana utahay in aad diido in aad ka qayb qaadato. Hadii aad diido, wax saameyna xun oo ay kugu yeelan majirrto si kastaba ha ahaatee. Xor ayaad uthay in aad dib oga laabato baaristan xili kasta xitaa hadii aad marka hore ogalaatay in aad ka qayb qaadato.

Cilmi baaristan waxaa aqbalay Gudiga anshaxa cilmi barista caafimaadka ee jaamacadaa Stellenbosch (Health Research Ethics Committee at Stellenbosch University). Waaxaana loo fulin doonaa qaabka xeererka akhalaaqiga iyo mabda'a bayaanka caalimiga ee Helsinki , xeerarka xirfada bukaan eegidda fucan ee konfur Afrika iyo gudiga ama golaha cilmi barista caafimaad (MRC) xeerarka akhaaqiga ee cilmi barista.

Waa maaxay waxa cilmi baaristan ay kusaab santahay?

Baaristna waxaa lagu qaban doona xarooyinka qaxootiga ee Dadaab khaas ahaan xerada Ifo iyo Hagadera. Dadweynaha la bar tilmaameedsanayo waxa ay nagon dooonaan caruurta da'dodu udhaxeyso Lix bilood ilaa konton iyo sagaal bilood (6-59 nilood). Kuwaasoo ay ku socoto daaweynta xarunta xasilinta (SC) iyo xarumaha daryeelka ama daawenta bukaan socadka (OTP).

Baaristan waxa ay u baahantahay baqol, labaatan iyo sided caruur ah (128 children) iyo xanaaneyeyaalkooda. Adiga iyo canuyaaga waxaad ka mid tihiin kuwa la doortay ee lagu casumay in ay ka qayb qaataan baaristan.

Mashruuca cilmi baaristan waxaa lagu baarayaa wax yaabaha sabab aqoonta xanaaneeyaha uleeyahay daaweynta la siinayo carurta nafaqa darida hayso iyo sida aqoontoodu gacan ooga geysan karto ladnaanshada caruurta iyagoo adeecaya daaweynta loo qoray taasoo yareyndyso qadarka diidmada oona muujinesyo dadaalo lagu yareynaayo dhimashada la xiriirta nafaqa darida ee caruurta shanta sano ka yar.
Baaristan waxaay ku lug leedahay qaaditaanka cabirka culayska (weight), dhererka (height) , iyo wareega bartanka gacanta (MUAC) ee caruurta loo doortay sida todobaadlaha ah xiliga baaristan. Waxaa kale oo ay dalban doontaa in la ogaada waxa caruurta bukaanka ah lagu nafaqeeyo iyo daawooyiinka la siiyo. Xannaneeye ahaan waxaa lagaa wareysan doonaa waxa aad ka garanesyo daaweynta canugaaga uu ka helaaya mashruucan.

Maxaa lagugu casuumay idaad ka qayb qaadato cilmi baaristan?

Waxaa lagugu casuumay in aad ka qayb qaadato cilmi baaristan waayo waxaa tahay xanaaneeyaha ogu sokeya ee canuga bukaanka ah waxaad na tahayo kan oogu fiican ee soo bandhigi karo macluumaadka la codsanaayo eel la xiriira daawetnta caguga la siinayo.

Waajibaadkaaga maxaay noqon kartaa?

Waajidaadkaga la xiriira cilmi baaristan waxay nagoneysaa in aad kajabaabto su'aalaha cilmi baaraha ku weydin doona ee ku saabsan canuyaaga daaweynta uu helaayo.Waxaa kale oo lagaa codsan doonaa in aad kucaawiso xasilinta canugaaga marka la miisaamayo lagana qaadayo cabirkiisa culeyska, dhererka iyo wareega gacanta.

Baaristan waxaay qaadan doontaa mudo labaatan iyo kow maalmood ah haduu canugaaga kujiro mashruuca SC ga (xarunta xasilnta) waqtiga cilmi baaristan. Baaraha wuxuu kaa codsan doonxaa in aad usoo bandhigto macluumaadka la xiriira habka canugaaga u quudanayo. Waxaa kale oo canugaaga laga cabiri donaa culayska iyo wareega gaanta maalin kasta tani waxaay kugu qaadan karta oogu badnaan shan iyo toban dagiigo (18 minutes).

Hadii canugaaga kujiro mashruuca daaweynta bukaan socodka (OTP), baaristan waxay qaadan doontao oogu dadnaan sided wiik (labo bilood). Waqtigan, markaad u imaato boodgashadaada todobaadlaha ah, cilmi baarah wuxuu kaa codsan doonaa in uu wareysi kula yeesho si uu u aruuriyo macluumaadka la xiriira sida canugaaga u quudanayo waxaa na canugaaga laga cabirayaa culasyka, dhererka iyo wareega gacanta. Waxaay kugu qaadaneysaa oogu badhaan shan iyo toban dagiiqo.

Waxaa intaas dheer, in cilmi baaraha mararka qaarkood uu kaa codsan karo in aad usoo bandhigto macluumaadka la xiriira oragtidaada ee tayada daryeelka caafimaad uu canugaaga halkan ka helaayo waxaayna qaadan kartaa muddo shan iyo toban dagiigo ah.

Faaiido miyaad ku qabtaa ka qayb galkaga cilmi baaristan?

Faaiido toos ah adiga iyo canugaaga aad ka heleysaan ka qayb qaadashada baaristan majiraan. Hase-yeeshee, natiyooyinka ,baaristan aya loola dan leeyahay in go'aan gaarayaasha mashruucan iyo sameeyayaasho qorshaha caafimaada si ay u hagaajiyaan maamulka nafaqo xumada daran ee carurta mustaqbalka.

Ma wax Qatar ah oo laxiriira ka qayb qaadashadaada ayaa jirtaa?

Nooca cilmi baaristan darteed qatar la oddorosi karo majirto hadii aad go'aansato in aad kaqayb qaadato cilmi baaristan.

Hadii aad ogoleyn in aad ka qayb qaadato ,wado kale makuu furrantahay?

Hadii aad rabin aad ka qayb qaadato cilmi baaristan saameyn xun kuguma yeelaneeyso si kastaba ha ahaatee. Sidoo kale daaweynta canugaga mushruucan uu ka helaayo saameyn kuma lahaaneyso.

Yaa isticmaali qoraal kaaga caafimaad?

Baaraha cilmi baaristan iyo kaal kaaliya yaashiisa aya isticmaali doono canugaaga faylkiisa caafimaad si ay ooga uruuriyaan akhabaaraadka cilmi baaristan ubaahantahay. Markaad macluumaadkan bixineesyo, aqoonsigaa lama soo bandhigaayoo xiliga wareysiga iyo kadib ba. Sidoo kale macluumaadka la uruuriyay xiliga baaristan waxaa loola macaamili doonaa si qarsoodi dhamaystiran waana la illaalini. Hadii war bixinta cilmi baaristan loogu daahdo daabacaad ama Qoraal , agoonsigaaga iyo tan canugaaga waxaay ahaanayaan mid qarsoon.

Maxaa dhici kara hadii dhacdo dhaawae lama fillan ah oo la xiriirta ka qayb qaadashadaadan kugu dhacdo?

Nooca cilmi baaristan ma aban mid sababi karto dhaawac la oddorosi karo oo toos ah amo si cad oola xiriira ka qayb qaadashadeda sidaas awgee wax mag dhaw ah oo rajeynyo majirto.

Mushaar ama lacag miyaa laguugu siini ka qayb qaodashadaada cilmi baariston wax qiimo oo la xiriiro miyaa jiraa?

Wax lacag oola lagugu siinaayo ka qayb qaadashada baaristan majirto wax qiimo oo kugu jiro marto hadii aad ka qayb qaadata.

Ma wax kale oo in aad ogaato ubaahantahay ama sameyn lahayd ayaa jira?

- Waxaad la xiriiri kartaa : **Dr.Irene Ogada**

- Telefoon lambor: **+254 723 955 466** hadii aad su'aalo dheeraad ah qabto ama aad la kulanto wax dhibaato ah.
- Waxaa kale oo la xiniri kartaa jaamacada Stellebech golaheeda anshaxa cilmi baarista caafimaad ood kala xiri karta **+27 021-938-9207** ama jaamacada Kenyatta gudiga anshaxa cilmi baarista oo kala xiniiri karto **+254 20871-090-119** hadii aad ahmiyad uhasyo ama wabo asthtako si fiican cilmi baaraha u xalinin ay jirto
- Waxaa lagu siini macluumaadkan koobigiisa iyo foomka ogolaansishaha si aad u kaydsato adiga.

Bayaanka ka qayb qaataha

Saxiixa halkan hoose aan saxiixaayo anigoo ah ……

Waxaan ogolaaday in ann ka qaylo qaato cilmi baaristan la magic baxday: *Severe acute malnutrition: the effects of caregivers' knowledge on default rates at Dadaab Refugee Camps, Kenya.*

Waxaan shaaca ka qaadayaa in:

- Aan aqriyay ama la ii aqriyaymalcuumaadkan iyo foomkan ogolaanshaha ah oo na kuqarantahay aan faseex ku ahay.
- Aan haystay waqti aan su'aalo ku kuweediiyo su'aalahaygiina si igufilan ayaa looga jabaabay.
- Aan fahansanahay in ka qayb qaadashada cilmi baarsitan ay tahay mid iskaa ah oo na laigu cadaadinin in aan ka qayb galo.
- Xiligaan doono Ayaan katagi karaa baarsitan mana laiyu ciqaabi karo ama laigu nice karo.
- Laiga codsan karo in aad katago baaristan inta ay dhamaan kahor hadii dhaqtarka baarista ama cilmi baaraha ay dareemaan in ay maslaxo ii taha tahay ama hadii aanan raacin qorsheha cilmi baaristan sidii iskuogalaane.

Saxiix halkan …….. Taariiq ……..2015

…….. ……

Saxiixa kaqayb qaataha Saxiixa marqaatida

Bayaanka baaraha

Anigooh ……..waxaan shoaca kaqaadayaa in:

- In aan umacneeyay macluumaadka dhukumintigan……..
- In aan kudhiirin galiyay in su'aalo weydiiyaan waxaana qaatay waqti kufilan jabaabtoda.
- In aan ku qanacsanahay in ay si kufilan ufhmeen gaababka cilmi baaristan lan oo dhan sida kuxusan
- In aan isticmaalay ama isticmaalin turjumaan (hadii turjumaan la isticmaalay waa inuu saxiixaa bayaanka hoose)

Saxiix halksn…….. Taariiq ……2015

…… ……

Saxiixa baaraha Saxiixa margaatida

Bayaanka turjumaanka

Anigoo ah …….waxaan shaaca ka qaadayaa in:

- Aan caawiyay baaraha (magaca ka qayb qaataha)……. In uu umacneeyo macluumaadka dhukumintigan anigoo isticmaalaya luugada afka soomalida.
- In aan ku dhiirigaliyay iyaada/asaga in ay weeydiiyaan su'aalo waxaano qoadanay waqti kufilan jabaab siintooda.
- In aan gudbiyay xaqiigda saxda ah ee aniga igusaabsa
- In aan ku qanacsanahay in ka qayb qaataba uu si buuxdo u fahmayo ujeedada war bixinta dhukumintigan ogoloanshaha ah oo na su'aalihiisa si raali galin karto looga jabaabay.

Saxiix halkan……. Taaniq……..2015

…… ……..

Saxiixa turjumaanka Saxiixa marqaatida

Appendix H: Research Ethics Clearance (Stellenbosch University)

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot • your knowledge partner

Approved with Stipulations
Response to Deferral

14-Jan-2015
Mbogo, Alexander AM

Ethics Reference #: S14/06/133
Title: **Severe acute malnutrition: the effect of caregivers knowledge on default rates at Dadaab Refugee Camps, Kenya.**

Dear Mr Alexander Mbogo,

The **Response to Deferral - *(New Application)*** received on **14-Oct-2014**, was reviewed by members of **Health Research Ethics Committee 1** via Expedited review procedures on **14-Jan-2015**.

Please note the following information about your approved research protocol:

Protocol Approval Period: **14-Jan-2015 -14-Jan-2016**

The Stipulations of your ethics approval are as follows:
Kindly provide the HREC with copies of the following permission letters once obtained:

- Kenyatta University REC
- United Nations High Commission of Refugees
- International Rescue Committee (IRC) at Hagadera Refugee camp
- Islamic Relief of Kenya at Ifo Refugee camp

Please note that study related activities may not proceed before these permission letters are in place.

Please remember to use your **protocol number** (**S14/06/133**) on any documents or correspondence with the HREC concerning your research protocol.

Please note that the HREC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

After Ethical Review:
Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly for an external audit.
Translation of the consent document to the language applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Provincial and City of Cape Town Approval

Please note that for research at a primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Helene Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

We wish you the best as you conduct your research.
For standard HREC forms and documents please visit: www.sun.ac.za/rds

If you have any questions or need further assistance, please contact the HREC office at 219389156.

Included Documents:
Investigator declaration (van Niekerk)
Investigator CV (Mbogo)
Protocol Synopsis
DEF_Protocol
Budget
Cover letter
Protocol
DEF_Consent form
DEF_Cover letter
Investigator CV (Schubl)
DEF_Protocol Synopsis
HREC New application form
Investigator CV (van Niekerk)
Investigator declaration (Schubl)
Informed consent form
HREC general checklist
Investigator declaration (Mbogo)

Sincerely,

Franklin Weber
HREC Coordinator
Health Research Ethics Committee 1

Investigator Responsibilities

Protection of Human Research Participants

Some of the responsibilities investigators have when conducting research involving human participants are listed below:

1.Conducting the Research. You are responsible for making sure that the research is conducted according to the HREC approved research protocol. You are also responsible for the actions of all your co-investigators and research staff involved with this research.

2.Participant Enrolment. You may not recruit or enrol participants prior to the HREC approval date or after the expiration date of HREC approval. All recruitment materials for any form of media must be approved by the HREC prior to their use. If you need to recruit more participants than was noted in your HREC approval letter, you must submit an amendment requesting an increase in the number of participants.

3.Informed Consent. You are responsible for obtaining and documenting effective informed consent using **only** the HREC-approved consent documents, and for ensuring that no human participants are involved in research prior to obtaining their informed consent. Please give all participants copies of the signed informed consent documents. Keep the originals in your secured research files for at least fifteen (15) years.

4.Continuing Review. The HREC must review and approve all HREC-approved research protocols at intervals appropriate to the degree of risk but not less than once per year. There is **no grace period.** Prior to the date on which the HREC approval of the research expires, **it is your responsibility to submit the continuing review report in a timely fashion to ensure a lapse in HREC approval does not occur.** If HREC approval of your research lapses, you must stop new participant enrolment, and contact the HREC office immediately.

5.Amendments and Changes. If you wish to amend or change any aspect of your research (such as research design, interventions or procedures, number of participants, participant population, informed consent document, instruments, surveys or recruiting material), you must submit the amendment to the HREC for review using the current Amendment Form. You **may not initiate** any amendments or changes to your research without first obtaining written HREC review and approval. The **only exception** is when it is necessary to eliminate apparent immediate hazards to participants and the HREC should be immediately informed of this necessity.

6.Adverse or Unanticipated Events. Any serious adverse events, participant complaints, and all unanticipated problems that involve risks to participants or others, as well as any research-related injuries, occurring at this institution or at other performance sites must be reported to the HREC within **five (5) days** of discovery of the incident. You must also report any instances of serious or continuing problems, or non-compliance with the HRECs requirements for protecting human research participants. The only exception to this policy is that the death of a research participant must be reported in accordance with the Stellenbosch Universtiy Health Research Ethics Committee Standard Operating Procedures www.sun025.sun.ac.za/portal /page/portal/Health_Sciences/English/Centres%20and%20Institutions/Research_Development_Support/Ethics/Application_package All reportable events should be submitted to the HREC using the Serious Adverse Event Report Form.

7.Research Record Keeping. You must keep the following research-related records, at a minimum, in a secure location for a minimum of fifteen years: the HREC approved research protocol and all amendments; all informed consent documents; recruiting materials; continuing review reports; adverse or unanticipated events; and all correspondence from the HREC

8.Reports to the MCC and Sponsor. When you submit the required annual report to the MCC or you submit required reports to your sponsor, you must provide a copy of that report to the HREC. You may submit the report at the time of continuing HREC review.

9.Provision of Emergency Medical Care. When a physician provides emergency medical care to a participant without prior HREC review and approval, to the extent permitted by law, such activities will not be recognised as research nor will the data obtained by any such activities should it be used in support of research.

10.Final reports. When you have completed (no further participant enrolment, interactions, interventions or data analysis) or stopped work on your research, you must submit a Final Report to the HREC.

11.On-Site Evaluations, MCC Inspections, or Audits. If you are notified that your research will be reviewed or audited by the MCC, the sponsor, any other external agency or any internal group, you must inform the HREC immediately of the impending audit/evaluation.

Appendix I: Research Ethics Clearance (Kenyatta University)

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Email: chairman.kuerc@ku.ac.ke
secretary.kuerc@ku.ac.ke
ercku2008@gmail.com
Website: www.ku.ac.ke

P. O. Box 43844 - 00100 Nairobi
Tel: 8710901/12
Fax: 8711242/8711575

Our Ref: KU/R/COMM/51/410

Date: 25th February, 2015

Alexander Mbogo
Stellenbosch Universiteit

Dear Mbogo,

APPLICATION NUMBER PKU/307/E283– "SEVERE ACUTE MALNUTRITION: THE EFFECT OF CAREGIVERS KNOWLEDGE ON DEFAULT RATES AT DADAAB REFUGEE CAMPS, KENYA"

1. IDENTIFICATION OF PROTOCOL
The application before the committee is with a research topic, **"Severe Acute Malnutrition: The Effect Of Caregivers Knowledge On Default Rates At Dadaab Refugee Camps, Kenya."** Received on 2nd February 2015, discussed on 20th February, 2015.

2. APPLICANT
Alexander Mbogo

3. SITE
Dadaab Refugee Camps, Kenya.

4. DECISION
The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (section 7.2.1.3) and the Kenyatta University Ethics Review Committee Guidelines **AND APPROVED that the research may proceed for a period of ONE year from 25th February, 2015.**

5. ADVICE/CONDITIONS
i. Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.
ii. Serious and unexpected adverse events related to the conduct of the study are reported to this board immediately they occur.
iii. Notify the Kenyatta University Ethics Committee of any amendments to the protocol.
iv. Submit an electronic copy of the protocol to KUERC

When replying, kindly quote the application number above.
If you accept the decision reached and advice and conditions given please sign in the space provided below and return to KU-ERC a copy of the letter.

PROF. NICHOLAS K. GIKONYO
CHAIRMAN ETHICS REVIEW COMMITTEE

I ..ALEXANDER MBOGO.....accept the advice given and will fulfill the conditions therein.

Signature..... Dated this day of....02/04/..... 2015.

cc. Vice-Chancellor

Appendix J: Research Permit – National Commission of Science, Technology & Innovation

THIS IS TO CERTIFY THAT:
MR. ALEXANDER MUTHII MBOGO
of STELLENBOSCH UNIVERSITY,
20723-202 nairobi,has been permitted
to conduct research in *Garissa County*

on the topic: *SEVERE ACUTE MALNUTRITION: THE EFFECT OF CAREGIVERS KNOWLEDGE ON DEFAULT RATES AT DADAAB REFUGEE CAMPS, KENYA*

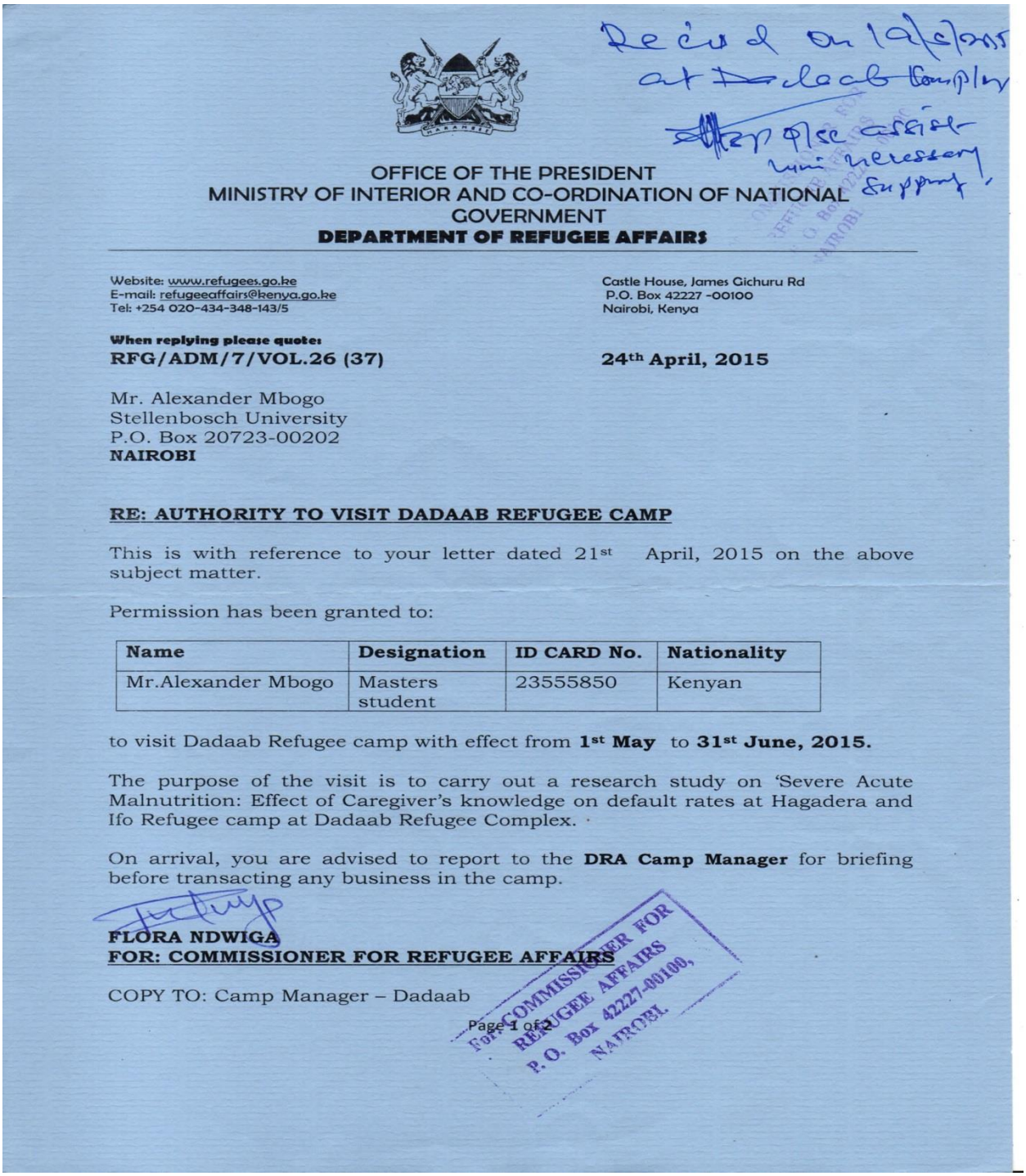
for the period ending:
31st August,2015

.....
Applicant's Signature

Permit No : NACOSTI/P/15/4871/5678
Date Of Issue : 13th April,2015
Fee Recieved :Ksh 1,000

.....
Director General
National Commission for Science, Technology & Innovation

Appendix K: Clearance – Department of Refugee Affairs



Received on 19/5/2015 at Dadaab Complex
Security affairs unit necessary support

OFFICE OF THE PRESIDENT
MINISTRY OF INTERIOR AND CO-ORDINATION OF NATIONAL GOVERNMENT
DEPARTMENT OF REFUGEE AFFAIRS

Website: www.refugees.go.ke
E-mail: refugeeaffairs@kenya.go.ke
Tel: +254 020-434-348-143/5

Castle House, James Gichuru Rd
P.O. Box 42227 -00100
Nairobi, Kenya

When replying please quote:
RFG/ADM/7/VOL.26 (37)

24th April, 2015

Mr. Alexander Mbogo
Stellenbosch University
P.O. Box 20723-00202
NAIROBI

RE: AUTHORITY TO VISIT DADAAB REFUGEE CAMP

This is with reference to your letter dated 21st April, 2015 on the above subject matter.

Permission has been granted to:

Name	Designation	ID CARD No.	Nationality
Mr.Alexander Mbogo	Masters student	23555850	Kenyan

to visit Dadaab Refugee camp with effect from **1st May** to **31st June, 2015.**

The purpose of the visit is to carry out a research study on 'Severe Acute Malnutrition: Effect of Caregiver's knowledge on default rates at Hagadera and Ifo Refugee camp at Dadaab Refugee Complex.

On arrival, you are advised to report to the **DRA Camp Manager** for briefing before transacting any business in the camp.

FLORA NDWIGA
FOR: COMMISSIONER FOR REFUGEE AFFAIRS

COPY TO: Camp Manager – Dadaab

For COMMISSIONER FOR REFUGEE AFFAIRS P.O. Box 42227-00100, NAIROBI

Page 1 of 2

Appendix L: Consent Letter – International Rescue Committee, Kenya

Gmail

Mbogo Alexander <mbogoalexander@gmail.com>

Permission to under take academic research at Hagadera Refugee Camp

Mbogo Alexander <mbogoalexander@gmail.com> Fri, May 8, 2015 at 6:25 PM
To: Martin.Omukuba@rescue.org

Dear Martin,

Trust you are well. I have been to IRC Head Offices for about one week but I have not been successful to get the right person to address my issue and have been referred to you for assistance. I am a final year, Kenyan student pursuing MSc. Human Nutrition at Stellenbosch University, South Africa. As part of the requirements for the Degree of Master of Human Nutrition I intend to carry out a research study on 'Severe Acute Malnutrition: Effect of caregiver's knowledge on default rates at Hagadera and Ifo Refugee Camps at Dadaab Refugee Complex.' Kindly find the attached synopsis of the research study.

I have obtained permission from Department of Refugee Affairs to carry out research at Dadaab Refugee Camps in nutrition programs at Hagadera and Ifo Main besides having obtained other clearance from National Commission for Science, Technology & Innovation and also having received research ethics clearance from: Stellenbosch University Research Ethics Committee, and Kenyatta University Research Ethics Committee.Kindly find attached here DRA and NACOSTI clearance.

I intend to commence data collection from 11th May to early July 2015 which will cover a period of about eight weeks.

Therefore,I am requesting for the consent to enable me undertake this research. I will greatly appreciate if you can expediently assist me in this to be able to meet data collection schedule assigned to me from the university.

Kind regards

Alexander

3 attachments

Synopsis of the study 2015.pdf
294K

Authority from DRA(1).pdf
679K

Permission from NACOSTI.pdf
473K

Gmail

Mbogo Alexander <mbogoalexander@gmail.com>

Permission to under take academic research at Hagadera Refugee Camp

Martin Omukuba <Martin.Omukuba@rescue.org> Mon, May 11, 2015 at 8:33 AM
To: "mbogoalexander@gmail.com" <mbogoalexander@gmail.com>
Cc: Eric Ogara <Eric.Ogara@rescue.org>, Conor Phillips <Conor.Phillips@rescue.org>, Fred Musinya <Fred.Musinya@rescue.org>

Dear Alexander,

Having reviewed your request, we do not foresee any issues with your research and we look forward to read the final findings so as to enable us improve on our program delivery. Please let me know if there is any other help that you do require.

Best regards,

Martin

From: Mbogo Alexander [mailto:mbogoalexander@gmail.com]
Sent: Friday, May 08, 2015 6:26 PM
To: Martin Omukuba
Subject: Permission to under take academic research at Hagadera Refugee Camp

[Quoted text hidden]

3 attachments

Synopsis of the study 2015.pdf
294K

Authority from DRA(1).pdf
679K

Permission from NACOSTI.pdf
473K

Appendix M: Islamic Relief – IRK Notification

ISLAMIC RELIEF

Kirichwa Road off Ngong Road /Argwings Kodhek.
P.O. Box 417-00202 (KNH) Nairobi, Kenya.
Tel: +254-20-3861215 Fax: +254-20-3861216 Cell: +254 727 531 220, +254 734 740 074
E-mail: info@islamic-relief.or.ke
www.islamicreliefkenya.org

20th May, 2015

Our ref: VL.02/IRK/RESERACH/15

Alexander Mbogo

P.O.BOX 207203, Nairobi.

Dear Sir,

RE: NOTIFICATION

This is with the reference to your letter dated 20th May 2015, regarding your research request. We are pleased to inform you that you're granted for the opportunity as requested with effect from 21st May, 2015 to 31st June, 2015 subject to clause 3 below.
The following are the terms of this notification letter:-

1. **Location**
   IRK operates Nutrition programme in IFO camp and any information you may require can be obtained from the nutrition officer.(Florence)
2. **Benefits**
   There is no employer - employee relationship between you and IRK and no benefits are attached to you during the research period. You are required to meet all your requirements. IRK May provide your transport during your research period depending on availability
3. **Terms and Conditions**
   You are required to respect IRK values during your interaction with staff and beneficiaries. Violation of IRK values may lead to denial of acess to IRK service delivery points
4. **Liability/Waiver**
   IRK is not liable for any damage/destruction to property or death/injury to yourself or your agents whatsoever during this period of your research of (20th May to 30th June 2015).

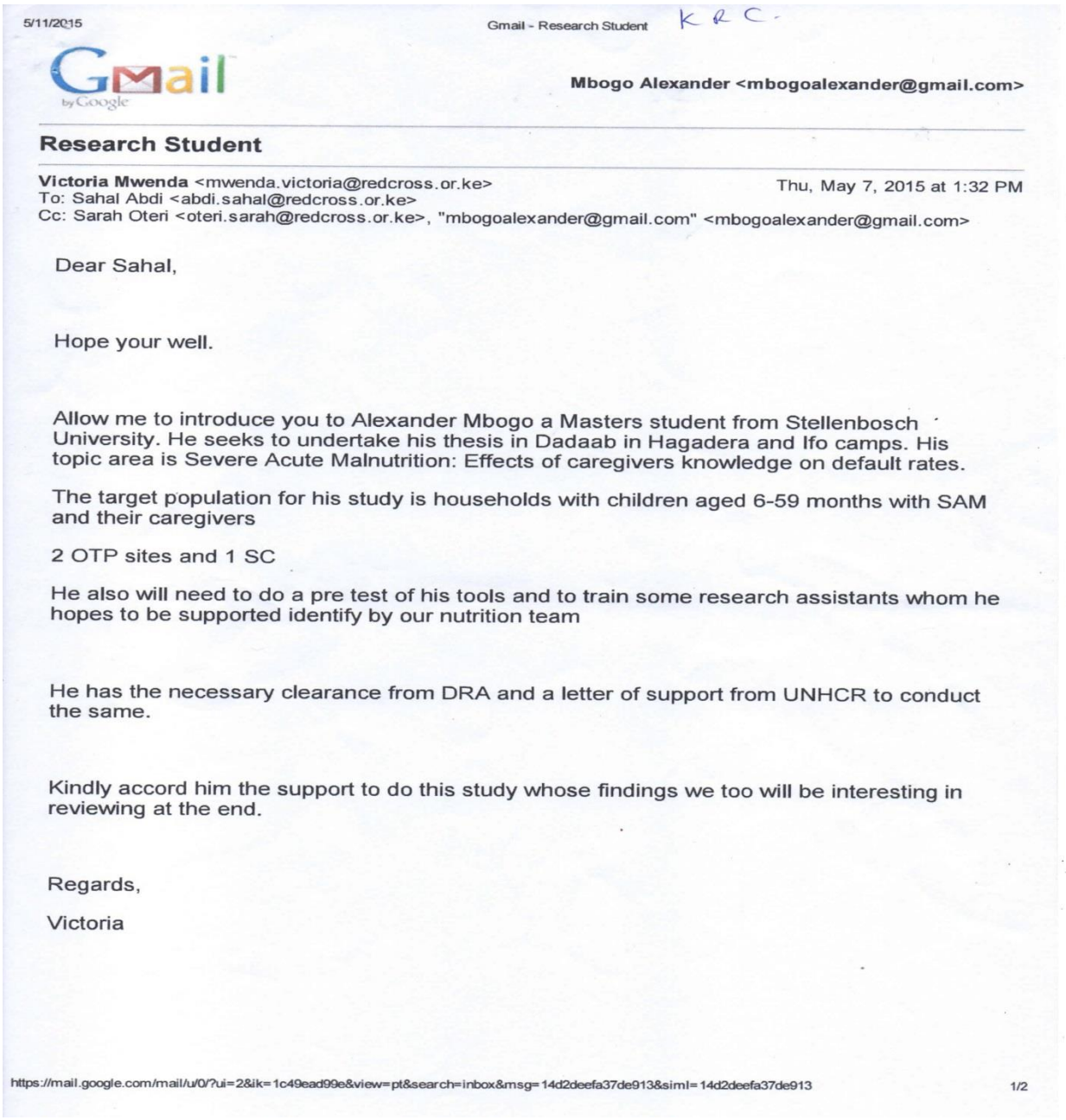
This letter is sent in duplicate and we request you to execute the acceptance clause and return our file copy.

Yours Sincerely,

Abdullahi Mohamed

Area Manger

Appendix N: Consent Letter – Kenya Red Cross



5/11/2015 Gmail - Research Student K R C.

Gmail by Google

Mbogo Alexander <mbogoalexander@gmail.com>

Research Student

Victoria Mwenda <mwenda.victoria@redcross.or.ke> Thu, May 7, 2015 at 1:32 PM
To: Sahal Abdi <abdi.sahal@redcross.or.ke>
Cc: Sarah Oteri <oteri.sarah@redcross.or.ke>, "mbogoalexander@gmail.com" <mbogoalexander@gmail.com>

Dear Sahal,

Hope your well.

Allow me to introduce you to Alexander Mbogo a Masters student from Stellenbosch University. He seeks to undertake his thesis in Dadaab in Hagadera and Ifo camps. His topic area is Severe Acute Malnutrition: Effects of caregivers knowledge on default rates.

The target population for his study is households with children aged 6-59 months with SAM and their caregivers

2 OTP sites and 1 SC

He also will need to do a pre test of his tools and to train some research assistants whom he hopes to be supported identify by our nutrition team

He has the necessary clearance from DRA and a letter of support from UNHCR to conduct the same.

Kindly accord him the support to do this study whose findings we too will be interesting in reviewing at the end.

Regards,

Victoria

https://mail.google.com/mail/u/0/?ui=2&ik=1c49ead99e&view=pt&search=inbox&msg=14d2deefa37de913&siml=14d2deefa37de913 1/2

Victoria Mwenda
Nutrition Advisor
Kenya Red Cross Society
P. O. Box 40712 | Nairobi, 00100 | Kenya
Tel: 6003593 / 3950000 / 0722-206958 / 0733-333040
Personal cell: 0721822030
Email: mwenda.victoria@redcross.or.ke

Nutrition is Key: Take up your Role...ACT NOW

Appendix O: Consent Letter – Garissa County commissioner

THE PRESIDENCY

MINISTRY OF INTERIOR & CO-ORDINATION OF NATIONAL GOVERNMENT

Telegrams: "COUNTY" GARISSA.
Telephone: Garissa
ccgsacounty@gmail.com

OFFICE OF THE
COUNTY COMMISSIONER
P.O BOX 1-70100
GARISSA COUNTY

When replying please quote

REF.NO: CC/EDU/7/3/(10)

19 May 2015

Alexander Muthii Mbogo
Stellenbosch University
SOUTH AFRICA.

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION

Refer to your letter Ref No. NACOSTI/P/15/4871/5678 dated 13th April, 2015 from the Director General/CEO National Commission for Science Technology and Innovation application for authority to carry out research on "***Severe acute malnutrition: The effect of caregivers knowledge on default rates at Dadaab Refugee Camps, Kenya***"

I am pleased to inform you that you have been authorized to undertake your research in Garissa County.

J. K. Kiarida
Ag. County Commissioner
GARISSA COUNTY.

Appendix P: Consent Letter – County Education Director, Garissa

MINISTRY OF EDUCATION, SCIENCE & TECHNOLOGY

STATE DEPARTMENT OF EDUCATION

Telegram: "SCHOOLING" Garissa
Telephone: 046-210-2458, Garissa.
Fax: 046-210-2002
Email:pdeducation.nep@gmail.com
When replying please quote

REF:NEP/ED/6.26/vol.iii/49

COUNTY DIRECTOR OF EDUCATION
GARISSA
P. O. Box 8-70100
GARISSA

DATE: 19th May 2015

TO WHOM IT MAY CONCERN

ALEXANDER MBOGO

This is to certify that the above named who is conducting research on severe acute malnutrition has reported to this office. He is conducting the research from 19th of May to 31st of August 2015.

Any assistance given to him will be highly appreciated.

Adan Sheikh Abdullahi
County Director of Education
GARISSA

Appendix Q: Gantt Chart

	JULY-DEC 2012	JULY-DEC 2013	FEB-DEC 2013	FEB-SEPT 2014	NOV-OCT 2014	JAN-MAY 2015	MAY 2015	JUNE-JULY 2015	OCT-DEC 2015	JAN-APRIL 2016	MAY-OCT 2016	OCT 2016-FEB-2017
Literature study												
Presentation of protocol												
Applying for ethical approval & other permissions												
Pilot study												
Data collection												
Data processing												
Data analysis												
Presentation of research findings & thesis development												
Submit article to peer review journal												

Appendix R: Research Assistants' Training Schedule

Research Assistants Training Schedule – 25 May,2015 at Ifo II Extension		
Time	**Topic**	**Presentation Mode**
8.30–9.00 am	• Introduction: What is severe acute malnutrition? • Objectives of the study • Study subjects • Sample size • Duration of the study	Lecture
9.00–9.30 am	Questionnaire and consent form	Group discussions, role plays
10.00–10:45 am	• Admission and discharge criteria : Stabilisation Centre(SC) & Out-patient Therapeutic Feeding Programme (OTP) • Clinical assessment for oedema: Grade +,++, +++, marasmus, kwashiorkor • *z*-scores – MUAC, height and weight measurements	Lecture, pictures Video, practical sessions
10.45–11.00 am	• Therapeutic feeds: F75 and F100 and routine medication provided in OTP • Conducting appetite test – "passing or "failing" appetite test • Who are defaulters?	Lectures, group discussion
11.00–11.30 am	• How to extract data from OTP cards to fill in the questionnaires (old ones as samples) • Checking ration cards for quantities of therapeutic feeds prescribed	Lecture and group assignment
11.30 am–12.00 pm	• Subject recruitment – screening tool: inclusion criteria, assigning groups into exposed group and non-exposed group • Follow up	Lecture
12.00–1.00 pm	Practical session	
2.00–3.00 pm	Practical session	Group discussion
3.00–3.15 pm	Terms of reference and final remarks	

Appendix S: Budget

Budget (Conversion used 1 KSh = 0.125495 ZAR)

N/s	Description	Cost	
		KSh	ZAR
1	Kenyatta University ethics review fees	3 000	376.50
2	Printing one copy of research protocol	1 030	129.30
3	Photocopying 12 copies of protocol for Kenyatta University ethics review	3 708	465.30
4	Photocopying 2 copies of protocol photocopy for KU supervisor	618	77.60
5	1 personal copy of research protocol	309	38.80
6	Spiral binding of 15 research protocol copies	600	75.30
7	Internet and documents editing	1 000	125.50
8	1 copy of protocol printing	1 030	129.30
9	2 copies of protocol to KU ethics office	618	77.60
10	1 copy of protocol to KU supervisor	309	38.80
11	1 personal copy of protocol	309	38.80
12	4 copies of research protocol binding	160	20.10
13	Research license fees by NACOSTI	1 000	125.50
14	Bus fare from Thika to Garissa	900	112.90
15	Accommodation at Garissa	600	75.30
16	Bus fare from Garissa to Dadaab	500	62.70
17	Accommodation at Dadaab	1 800	225.90
18	7 days' accommodation and meals	11 200	1 405.50
19	Photocopying research questionnaires	9 474	1 188.90
20	Research training and data collection stationery	2 160	271.10
21	Refreshments for one day for 12 research assistants in training	1 680	210.80
22	2 Safaricom airtime scratch cards	2 000	251.00
23	7 days' accommodation and meals	11 200	1 405.50
24	Fare from Dadaab to Nairobi	1 500	188.20
24	Safaricom airtime	3 000	376.50
26	10 days' accommodation and meals	16 000	2 007.90
27	12 days' accommodation and meals	19 200	2 409.50
28	12 Research assistants' payments	200 700	25 186.60
	Totals	295 605	37 096.70